

Bothalia.

A RECORD OF
CONTRIBUTIONS
FROM THE
NATIONAL HERBARIUM
UNION OF SOUTH AFRICA
PRETORIA

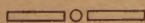


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PRETORIA

THE GOVERNMENT PRINTING AND STATIONERY OFFICE

1921

PREFACE.

WITH the advent of Union and the ever-increasing demands made by the public for information regarding the vegetable resources of the country, its plant poisons, and plant pests, considerable stimulus has been given to botanical research in South Africa.

One of the results of the progress made has been the establishment of the National Herbarium at Pretoria under the Department of Agriculture.

The National Herbarium now embraces all the more important private collections in the country, including those of Mr. E. E. Galpin, the late Mr. H. G. Flanagan, Madame A. Dieterlen's Basutoland herbarium, Miss A. Pegler's Kentani plants, Madame J. Borle's collections from Portuguese East Africa, and Mr. E. G. Bryant's plants from the Prieska and Hay Districts.

It also possesses the largest collection of South African fungi in existence, amongst which may be mentioned a large number of specimens of the superficial ascomycetes affecting our forest trees, and the original collections of Dr. Medley Wood, including a number of type specimens, while to it have been bequeathed the valuable cryptogamic collections of Dr. T. R. Sim; Tyson's collections of marine algae, including his private herbarium, have also been acquired by purchase.

A vast amount of material has thus been accumulated, and the special work which has been done on it in the past few years makes it very necessary and desirable that it should be published and made available to workers in other parts of the country. Consequently it has been decided to issue from time to time as occasion demands a publication which will consist of contributions from the National Herbarium.

In view of the great agricultural development which has taken place in South Africa since Union, and bearing in mind that much of this was due to the policy and influence of the first Union Premier and Minister for Agriculture—the late General Botha—no more fitting name for the official organ of the National Herbarium could be found than that of

“BOTHALIA.”

Bothalia is intended primarily as the medium for the publication of papers and monographs based on the material in the National Herbarium, presenting new facts and items of general interest.

It will include descriptions of new or little known plants, cryptogamic and phanerogamic, and it is hoped will mark a further step in the progress of botanical science in South Africa.

I. B. POLE EVANS.

Pretoria,

1st January, 1921.

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SOUTH AFRICAN ASCOMYCETES

IN THE

NATIONAL HERBARIUM.

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PART I.

Most of the South African fungi described in the early days were collected by MacOwan, Medley Wood, and others, who made a practice of sending a part of their material to Europe for determination and retaining the duplicates; many of these duplicates are now incorporated in the National Herbarium. These specimens are not strictly co-types, as they were not examined by the describers of the species, but since the specimens were all numbered, one rarely finds that they are not identical with the type specimens bearing the same numbers. The same applies to specimens sent to Sydow in more recent years, descriptions of which were published in the "Annales Mycologici."

Many alterations in nomenclature and classification have been introduced of late years, chiefly by V. Höhnelt, Theissen, and Sydow, who have published revised descriptions from the type specimens. In some cases it is possible to add a few details to these descriptions from more abundant and more recent collections, and to record the fungus on other hosts and from new localities.

There are also a number of ascomycetes in the Herbarium which have been previously recorded from other parts of the world, or which are apparently undescribed.

In every case the numbers quoted in square brackets are those of the mycological section of the National Herbarium.

I am indebted to Mr. W. E. Schilz for the preparation of a fine series of sections of the fungi under consideration and for considerable assistance in the translation of some of the descriptions from the original German.

1. *Schneeepia radiata* Doidge.

Syn. *Lembosia radiata* Doidge (South African Microthyriaceae, Trans. Roy. Soc. South Africa, VIII, Part 4, 1920).

On leaves of undetermined shrub (Leguminosae) Rikatli, Portuguese East Africa, Junod [11729].

This fungus was originally described as a *Lembosia*, but by studying sections through the leaf of the host an intramatrical hypostroma may be detected. This consists of a colourless hyphal mass lying between the cuticle and the epidermis, and sometimes penetrating downwards into the epidermal cells. In certain of the epidermal cells compact balls of dark coloured hyphae are formed, and at these points the fungus breaks through the cuticle to form the ascostroma.

The ascostroma is attached at several points and is almost 40μ high; the hypothecium is thin and colourless.

The intramatrical hypostroma with superficial ascomata is typical of the *Polystomellaceae*; the radial arrangement of the loculi which are attached at several points, the paraphysate asci, and two-celled brown spores are characteristic of the genus *Schneepeia*, to which this fungus must therefore be referred.

2. *Cycloschizon brachylaenae* (Rehm), P. Henn.

Engl. Bot. Jahrb. XXXIII, p. 39 (1902); Syll. Fung. XVII, p. 896.

Syn. *Schneepeia brachylaenae* Rehm, Hedwigia 1901, p. 173.

On living leaves *Brachylaena neriifolia*, Bains Kloof, near Wellington, C.P., 12.11.10, Doidge [981].

On *Brachylaena dentata*, Port Elizabeth, West [761]; Van Stadens Pass, 9.3.16, Bottomley [9562]; Van Stadens Pass, 17.5.18, Pole Evans [11445].

On *Brachylaena discolor*, Lemana, Zoutpansberg District, 14.8.11, Doidge [1789]; Duikerfontein, Natal, 10.10.11, Moon [1887]; Port Shepstone, Natal, 15.10.12, Pole Evans [5605]; Umgeni, near Durban, 15.11.16, V. d. Bijl [10088].

On *Brachylaena elliptica*, East London, 24.11.17, Doidge [10912].

On *Brachylaena* sp., Rikatli, Portuguese East Africa, September, 1918, Junod [11724].

Sydow [Ann. Myc. XIII (1915), p. 207], described this fungus in detail from the type specimen (Exsicc. Rabh. P., F. Eur. et extra-europ., 4264), which agrees in every respect with the material in the National Herbarium. The original is evidently not quite mature, and in this connection Theissen and Sydow writes as follows:—"Die Art unterscheidet sich generisch nur durch die farblosen Sporen von *Dielsiella*; da die Asken des Originals noch nicht ganz ausgereift sind, wäre es nach diesem Exemplar nicht ausgeschlossen, dass die Sporen sich später bräunten; dan fele die Gattung *Cycloschizon* mit *Dielsiella* (1903) zusammen und letztere müsste gestrichen werden. Zu demselben Ergebnis kam V. Höhnelt (Fragm. n. 634 und 635). . . . Das oben erwähnte Exemplar auf *B. dentata* scheint jedoch völlig ausgereift zu sein. Wir fanden hier schon ausserhalb der Schläuche zahlreiche, stets völlig hyaline Sporen, Wahrscheinlich stellt *Cycloschizon* daher eine gute Gattung dar."

After examining the abundant material detailed above, it is evident that the spores of *Cycloschizon brachylaenae* become fuscous, and later brown, at maturity. The genus *Dielsiella* is therefore identical with *Cycloschizon* and the species *Dielsiella pritzelii* P. Henn., and *D. alyxiae* (Mass) Th. and Syd. become *Cycloschizon pritzelii* (P. Henn.) and *C. alyxiae* (Mass), respectively.

An apparently undescribed species on *Catha edulis* also belongs to the genus *Cycloschizon*, and is described below.

3. *Cycloschizon fimbriatum* n. sp.

On living leaves of *Catha edulis*, Letaba Drift, Zoutpansberg District, 6.8.11, Doidge [1798] and [1833]; Rikatli, Portuguese East Africa, 31.5.18, Junod [11682]; Louis Trichardt, 8.4.19, Putterill [11835].

Stromata amphigenous, scattered, circular, 1.5 to 2 mm. diam., surface dull black, crustaceous, with an irregular annular ridge marking the position of the loculi; attached to the leaf by a massive central foot, which is black and pseudo-cellular, arising from a dense hypostroma. The hypostroma consists of closely interwoven and packed hyphae, which completely destroy the palisade cells or the mesophyll cells in the immediate vicinity of the foot and penetrate right through the thickness of the leaf in the inter-cellular spaces. The increasing pressure of the hypostroma ruptures the epidermis, and at this point the foot is formed.

Except for the central foot, the stroma lies free on the leaf surface. The outer membrane is radial in structure, rather loosely interwoven, and composed of hyphae 3.5-4 μ thick. At the periphery it spreads out into a short fringe of brown, radiating hyphae about 3.5 μ thick; these are undulating, branched, and sometimes more or less

coherent. The central portion of the stroma is sterile, the loculi being arranged in a circle round the centre; loculi linear, about $270\ \mu$ wide and $100\text{--}115\ \mu$ high, dehiscing by a longitudinal fissure. Hypothecium pseudo-cellular, rather pale.

Asci paraphysate; ovate when immature, thick walled above, $60\ \mu \times 30\text{--}33\ \mu$, and with irregularly tristichous or conglobate spores. Mature asci clavate or ellipsoid, $75\text{--}90\ \mu \times 23\text{--}26\ \mu$ with distichous spores. Asci stain brick red with iodine; there is no blue reaction.

Paraphyses numerous, hyaline, linear, about $2.5\ \mu$ thick. Spores brown, opaque at maturity, two-celled, slightly constricted, ellipsoid, cells equal or sub-equal, $28\text{--}30\ \mu \times 12\text{--}13.5\ \mu$.

Cycloschizon fimbriatum Doidge, n. sp.

Stromata amphigena, sparsa, $1.5\text{--}2$ mm. diam., superficialia, centro affixa; centro sterili magno $400\text{--}500\ \mu$ diam.; irregulariter radiatim ex hyphis septatis $3.5\text{--}4\ \mu$ crassis brunneis composita, ambitu hyphis longiusculis radiantibus, $3.5\ \mu$ crassis, flexuosis, ramosis cincta; loculo annulari integro v. interrupto, $270\ \mu$ lato, $100\text{--}115\ \mu$ alto, rima longitudinale aperto. Asci paraphysati, clavati v. ellipsoidei, $75\text{--}90\ \mu \times 23\text{--}26\ \mu$, octospori, paraphysibus numerosis, hyalinis, linearibus, $2.5\ \mu$ crassis. Sporae brunneae, oblongae, medio vel paullo supra medium septatae, leniter constrictae, ad apicem rotundatae, $28\text{--}30\ \mu \times 12\text{--}13.5\ \mu$.

Hab. in foliis *Cathae edulis*, Zoutpansberg Dist., Transvaal, 6.8.11, leg. Doidge [1797].

4. *Cocconia porrigo* (Cke.) Sacc.

Syll. Fung. VIII, p. 738.

Syn. *Rhytisma porrigo* Cke., *Grevillea* X, p. 129 (1882).

On leaves of *Olea capensis*, Inanda, August, 1881, Wood No. 660 [10702]; Van Stadens Pass, C.P., 13.11.17, Doidge [10888].

Stromata amphigenous, but mostly epiphyllous, not crowded, round, flat, dull black, up to 5 mm. diameter; central portion raised and rugose, $120\text{--}140\ \mu$ thick. In the smaller stromata there is a regular circular locus forming a ring round the centre, and within it a second smaller locus which may be circular, S-shaped, or irregular. In the larger stromata there are several concentric, circular loculi. At the periphery the covering membrane is thin and membranaceous with lobed margins, and consists of radiating, brown, septate hyphae which are $4\text{--}4.5\ \mu$ thick. Hypostroma extensive, in and under the epidermis, dark, breaking out at many points and spreading horizontally on the cuticle; thus it forms a layer of short, septate hyphae about $26\text{--}30\ \mu$ thick, which becomes gradually thinner towards the periphery. Covering membrane radial in structure, carbonaceous, $30\text{--}40\ \mu$ thick. Height of stroma $140\text{--}160\ \mu$. Asci broadly ellipsoid, $80\text{--}85\ \mu \times 27\text{--}30\ \mu$ with distichous or tristichous spores. Paraphyses filiform. Spores dark brown, $30\text{--}33\ \mu \times 11\text{--}13\ \mu$, two-celled, constricted; loculi unequal, upper cell about $14\text{--}16\ \mu \times 13\ \mu$, broader and shorter than the lower cell, which is $16\text{--}18\ \mu \times 11\ \mu$.

5. *Cocconia concentrica* Syd.

Ann. Myc. XIII (1915), p. 215.

Syn. *Hysterostomella concentrica* Syd. Ann. Myc. VII (1909), p. 544; Syll. Fung. XXII, p. 556.

Hysterostomella circularis, Har. et Pat. Bull. Mus. Hist. Nat., 1911, p. 368.

On *Trichilia emetica*, Lourenço Marques, 24.9.08, T. R. Sim [508]; Umbelusi R. Portuguese East Africa, 9.11.10, Howard [1019]; Rikatli, P.E.A., September, 1918 Junod [11728].

This fungus has only been recorded from East Africa on *Trichilia emetica*.

It has been described by Sydow (*loc. cit.*) as follows:—On the upper side of the leaf there appear numerous concentric rings of small, black, punctiform bodies, which gradually

develop into small round discs. These form the central part of the stroma, and they later coalesce, forming stouter linear stromata which still show the original ring formation. Meanwhile the concentric ring formation continues at the periphery. The mature stroma is crustaceous in the centre, the original disc-like bodies having become confluent radially as well as laterally, but the concentric circles are still evident; the outer circles still comprise discrete, round, immature discs. The separate stromata vary considerably in length.

A transverse section through a collective stroma, which also passes through single stromata, shows a chain of fruiting bodies with central attachment, and with a sterile central portion.

The single stromata are thus attached to the leaf by their long axis, lying free on both sides of the keel formed by the line of attachment. They are $320\text{--}420\ \mu$ high. Beneath the sterile central portion the hypostroma fills the epidermal cells of the host in an area extending $100\text{--}120\ \mu$ in diameter. The hypostroma is not continuous, but more or less interrupted; and it produces numberless fine brown hyphae which pierce the cuticle and appear on the surface as a compact stroma. Asci club-shaped cylindrical, thick-walled round the apex, very briefly pedicellate, $45\text{--}55\ \mu \times 14\text{--}18\ \mu$, eight-spored. Spores distichous, elongated, rounded at both ends, two-celled, brown, $14\text{--}18\ \mu \times 4\text{--}5\ \mu$. Paraphyses filiform exceeding the asci in length, united above, and forming a somewhat coloured epithecium.

6. *Cocconia capensis* n. sp.

On leaves of *Ochna arborea*, Howiesons Poort, near Grahamstown, 12.7.19, Doidge [12373].

Stromata epiphyllous, round, dull black, minute, up to $1.5\ \text{mm. diam.}$, in appearance rather like a scale insect, centre raised, $130\text{--}150\ \mu$ high, margin flat, appressed to leaf surface; centre sterile, surrounded by a single circular loculus, $240\text{--}270\ \mu$ broad; covering membrane black, opaque, about $13\ \mu$ thick over the loculus, at the edge becoming somewhat lobed, thin, flat, and light coloured, consisting of fuscous, radiating hyphae, $3\text{--}3.5\ \mu$ thick.

Hypostroma very well developed, penetrating right through the leaf and forming a tangled web of hyphae in the intercellular spaces. At certain points the hypostroma becomes much thickened in the epidermal and subepidermal cells, and the hyphal mass becomes dark coloured and cellular, the cells being $6\text{--}7\ \mu$ diam.

It breaks through the cuticle and forms a short column of elongated cells, certain of which spread out radially on the leaf surface to form the hypothecium, and others growing to a higher level form the central sterile portion of the stroma, and give rise laterally to the covering membrane. The hypothecium is brown, $30\text{--}36\ \mu$ thick and similar in texture to the hypostroma, but the cells are flattened and elongated in a radial direction. There are numerous secondary points of attachment along the axis of the loculus.

Asci clavate, eight-spored, pedicellate, thickened round apex, paraphysate, $65\text{--}70\ \mu \times 22\text{--}25\ \mu$, they do not react to iodine; paraphyses numerous, filiform. Spores two-celled, brown, $21\text{--}23.5\ \mu \times 9\text{--}10\ \mu$, slightly constricted; in immature spores the cells are markedly different in form, they are equal in length, but the upper loculus is spherical, $9\ \mu$ diam., and the lower clavate, tapering from $7\ \mu$ at the centre to $4\ \mu$ at the tip. In mature spores the difference is less marked.

Cocconia capensis Doidge nov. sp.

Stromata epiphylla, sparsa, rotundata, atra, minuta usque $1.5\ \text{mm. diam.}$, $130\text{--}150\ \mu$ alta, pluries affixa, radiato ex hyphis $3\text{--}3.5\ \mu$ cr. contexta; loculo unico annulari, $240\text{--}270\ \mu$ lato, hypostromate epidermali et sub-epidermali oriunda. Hypothecium brunneolum $30\text{--}36\ \mu$ cr. Asci clavati, paraphysati, octospori, pedicellati, ad apicem incrassati, $65\text{--}70\ \mu \times 22\text{--}25\ \mu$; paraphysibus numerosis filiformis. Sporae brunneae, sub-clavatae, 1-septatae, constrictae, $21\text{--}23.5\ \mu \times 9\text{--}10\ \mu$, loculo supero latiore.

Hab. in foliis *Ochnae arboreae*, Howiesons Poort, 12.7.19, leg. Doidge [12373].

7. *Hysterostomina tenella* Syd.

Ann. Myc. XIII (1915), p. 228.

Syn. *Hysterostomella tenella* Syd. Ann. Myc. X (1912), p. 442.

On *Asparagus striatus*, Despatch, near Uitenhage, 23.3.11, Doidge [1241].

On *Asparagus* sp., Kentani, 19.3.12, Pegler [2240]; 3.6.12, Pegler [2362].

Stroma flat, membranous, dull black, 2–10 mm. long, irregular in shape, 70–80 μ high, on both sides of the leaf, or more or less clothing the stem. Loculi very closely crowded, irregularly arranged, dehiscing by a longitudinal slit; covering membrane radial, dark brown to black, opaque, formed of hyphae 3–4 μ thick. Hypothecium very thin, light brown. Asci paraphysate eight-spored, at first broad, oval, with conglobate spores; later becoming elongated, with distichous spores; very thick walled at the upper end, 45–60 $\mu \times$ 16–20 μ . They do not react to iodine. Spores dark brown, strongly constricted, cells spherical, sub-equal, elliptic-oblong, rounded at the ends, 13–16 $\mu \times$ 6–8 μ . Hypostroma not well developed; it can only be detected in the stomata in the form of pegs, 20–25 μ high and 14–16 μ thick, which do not penetrate into the intercellular spaces.



Fig. 1.—Section through loculus of *Macowaniella congesta*, showing hypostroma.

8. *MacOwaniella* Doidge, nov. gen. *Polystomellacearum*.

Stromata superficialia, radiato-contexta ex hypostromati epidermali et sub-epidermal oriunda; loculis linearibus, rectis v. curvulis, inordinate nidulantibus. Asci paraphysati octospori. Sporae phaeodidymae. Mycelium superficiale ramosum, septatum.

This genus differs from *Hysterostomina* in the presence of free mycelium, and from *Lembosiodothis* in the absence of sub-cuticular bands. The hypostroma is deep-seated in the tissues and is not sub-cuticular.

MacOwaniella congesta (Wint.), Doidge.

Syn. *Lembosia congesta* Wint., Syll. Fung. IX, p. 1105 [Wint. Exot. Pilze in Flora, 1884, p. 9].

On leaves and stems of *Carissa arduina*, Lemana, Zoutpansberg, 14.8.11, Doidge [1786]; Isipingo Beach, Natal, 21.5.17, Doidge [10155]; Cango Valley, Oudtshoorn

Dist., 9.11.17, Doidge [10898]; Woodville Forest, George, 11.11.17, Doidge [10929]; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10960]; Lovedale, Alice, 18.11.17, Doidge [10979]; Hogg's Back, C.P., 15.1.18, J. and M. Henderson [11345]; Grahams-town, 1917 [11369].

On *Carissa grandiflora*, Isipingo, Natal, 27.3.18, Bottomley [11380]; Krantzkloof, Natal, 26.5.15, Doidge [8983].

On *Carissa acuminata*, Stella Bush, Durban, 7.4.18, Bottomley [11381].

This fungus was originally described by Winter from material collected by MacOwan.

In his "Lembosia-studien" [Ann. Myc. XI (1913), p. 457], Theissen mentions this species, and dismisses it with a single sentence: "Der Beschreibung Winter's ist nur hinzuzufügen, dass die an hyalinen Hyphenbüschel entstehenden Konidien sichelförmig sind, einzellig, beid endig spitz, farblos, $20\ \mu \times 2\ \mu$." However, he omits it from his synopsis of species, and from this one would gather that he was doubtful about its systematic position.

The fungus on *Carissa arduina* is very common throughout the country, and with the abundant material at my disposal I have made a careful study of sections through the host, and find that it has a very abundant and well-developed hypostroma. It must therefore be placed in the Polystomellaceae. It differs from *Hysterostomina* in the presence of fairly well-developed superficial mycelium. I have therefore made it the type of a new genus *MacOwaniella*.

MacOwaniella congesta occurs on the younger branches of *Carissa* spp., less frequently on the leaves. Stromata, superficial, round or elliptic or irregular in shape up to 4 mm. diameter; loculi linear, straight, curved, or flexuous, closely crowded, irregularly arranged, 500–800 μ long and 180–220 μ broad; less frequently oval, attenuated towards both ends, 280–340 $\mu \times$ 160–175 μ ; rarely almost circular, 160–190 μ diam., 120–140 μ high, dehiscing by a longitudinal slit. Hypothecium pseudo-cellular, colourless or light brown in centre, consisting of thin-walled plectenchyma. Covering membrane radial in structure.

Hypostroma strongly developed, penetrating deep into the tissues, forming closely packed masses of interwoven hyphae in the intercellular spaces and in the cells. These are especially evident in the epidermal and sub-epidermal cells under the fruiting bodies, where at intervals the hyphal mass becomes thick walled and dark brown to black in colour, and is connected with the ascostroma by slender, brown to black, fungous pegs about 6 μ thick, which pierce the cuticle. At or near the point where the cuticle is pierced the dark hyphae often penetrate laterally into the cuticle for a short distance.

Asci oblong to clavate, attenuated into a short foot, eight-spored, paraphysate, 60–70 $\mu \times$ 21–26 μ . Paraphyses filiform, often forked at the apex, tips more or less conglutinate. Spores conglobate or sub-distichous, oblong, 1-septate, constricted, fuscous when mature, 17–18 $\mu \times$ 7–9 μ .

Mycelium on the leaves well developed, fuscous, undulating, abundantly branched, and anastomosing, with a few sessile, dark brown, hemispherical hyphopodia, 6.5–8 $\mu \times$ 6.5 μ on the primary hyphae; mycelium on the branches not so well developed, hyphae straighter, more slender, 3.5–5 μ thick, branches parallel, with occasional elongated reticulations.

9. *Asterodothis solaris* (K. and Cke.) Theiss.

Ann. Myc. X (1912), p. 179; Ann. Myc. XIII (1915), p. 232.

Syn. *Asterina solaris* K. and Cke., Grevillea IX, p. 33; Syll. Fung. I, p. 42, on *Olea verrucosa*, South Africa, Rabh. W., F. Eur. 365.

Lembosia albersii P. Henn., Bot. Jahrb. XXVIII, p. 39; Syll. Fung. XVII, p. 897, on *Elaeodendron* sp., East Africa.

Seyesia elegantula Syd., Engl. Bot. Jahrb., 1910, p. 463; Syll. Fung. XXII, p. 522, on *Xymalos* sp., Uganda.

On *Olea verrucosa* leg. MacOwan, 3991, Rabh. F. Eur. 3651; Wellington, C.P., 10.11.10, Doidge [1033]; Langholm Estates, Bathurst Dist., 14.7.19, Doidge [12346]; Barberton, 30.2.15, Thorncroft [8826].

On *Olea exasperata*, Belmont Valley, Grahamstown, 15.1.17, Doidge [10955].

On *Olea capensis*, Van Stadens Pass, 17.5.18, Pole Evans [11444]; Hoggs Back, C.P., 15.1.18, J. and M. Henderson [11339]; Paddock, Natal, 22.12.13, V. d. Bijl [8875].

On *Olea woodiana*, East London, 24.11.17, Doidge [10902].

On *Olea laurifolia*, Hoggs Back, C.P., 15.1.18, J. and M. Henderson [11343]; Kirstenbosch, December, 1916, Glover [10043]; Howiesons Poort, Grahamstown, 12.7.19, Doidge [12387]; Fort Cunynghame, March, 1915 [8896]; Schwarzwald, Victoria East, C.P., 11.8.15, V. d. Bijl [9464].

On *Elaeodendron croceum*, Kentani, 20.7.12, Pegler [2533]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12288]; Knysna, 3.6.12, Pienaar [2435].

On *Elaeodendron capense*, Grahamstown, 13.12.11, Burt-Davy [2070]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12295].

Stromata amphigenous but more frequently epiphyllous, forming dark brown to black, orbicular spots up to 2–4 mm. diam. These are usually quite distinctly radiate and fibrillar in structure, even to the naked eye.

The hypostroma may be detected within the leaf, lying between the epidermis and the palisade cells, and pushing down between the latter. In the *Elaeodendron* spp. there is more than one row of epidermal cells; but even then the internal mycelium penetrates between all the rows of cells as far as the palisade tissue. At certain points the hypostroma becomes much thickened and a hyphal mass is produced above the palisade cells which gives rise to a short, dark, cylindrical column of perpendicular prosenchymatous structure. This column or foot ruptures the epidermis and the hyphae composing it flatten out horizontally and form the stroma; certain of the hyphae form a hypothecium about 10 μ thick, and others growing to a higher level produce the radial covering membrane. The illustration of the stroma of *Asterodithis solaris* in the *Annales Mycologici* [13 (1915), Tafel I, Fig. 10] is somewhat misleading, as it depicts the loculi in close contact with the central column. This is not always the case, as in the large number of sections examined of the fungus on various hosts the central part of the stroma was sterile and the loculi were at some little distance, closely crowded, forming a sort of crown round central point or being irregularly scattered about the centre.

The central part of the stroma as seen in a surface section may be parenchymatous in structure, in which case the loculi show as small mounds; but frequently the loculi appear as dense black bodies borne on radiating hyphal strands which are more or less connected with one another. The loculi (external measurement) are round 200–250 μ diam., or oval, 250–300 $\mu \times$ 140–200 μ ; they dehisce irregularly by a stellate or longitudinal fissure.

In section the loculi are 120–160 μ high, and are connected with the intramatrical hypostroma by numerous dark coloured fungus pegs which pass through the stromata. This fact is not mentioned by Theissen.

Radiating from the stroma are numerous hyphae which are almost straight, dark brown, septate, 5–6 μ thick; these often become adnate by their radial walls and form hyphal strands. The hyphae produce branches, which form acute angles with the parent hypha.

On the hyphae are borne numerous outgrowths which may be regarded as rudimentary setae or bristles. These are sometimes very short and almost like hyphopodia in appearance; more frequently they are more or less erect, truncate, and up to 25 $\mu \times$ 7–8 μ . On the hyphae are also borne very dark brown, club-shaped conidia, which are 3–4 septate, blunt at the ends, and 36–42 $\mu \times$ 11–12 μ .

The fruiting layer is flat and the asci parallel, oval to clavate, eight-spored, 70–90 $\mu \times$ 24–28 μ . Paraphyses numerous, filiform. Spores distichous, ellipsoid, reddish-brown, smooth, 27–31 μ long, upper cell 10–12 μ broad, lower cell 8–10 μ broad.

The spores have a peculiar method of germination, the germ tubes appearing on the medial constriction between the two loculi, one on each side.

A fungus with a similar conidia to *Asterodithis solaris* has been collected on *Myrsine melanophlebos* [10908] and [8995], but unfortunately neither of these two collections bear mature ascostromata.

10. *Polyrhizon bewsii* n. sp.

On living leaves of *Elaeodendron aethiopicum*, Bisley, near Maritzburg, Natal, 11.4.17, Bews [10087]; 20.7.18, Doidge [11592].

Stromata amphigenous, scattered, raised, round to irregular, about 1 mm. diam., simple or compound, in the latter case 2-3 or more stromata arising close together become confluent. There is no discoloration of the leaf tissues in the neighbourhood of the stroma.

Intramaterial mycelium copious, consisting of colourless hyphae $3.5-4\ \mu$ thick, filling the intercellular spaces and penetrating right through the leaf so that stromata are usually formed at corresponding points on the upper and lower surface, one being older than the other. Each stroma is attached to the leaf by a central foot, which is a continuation of the brown compact hypostroma formed in the epidermal and sub-epidermal cells. This foot is $80-160\ \mu$ thick, and is continued into the stroma, forming a dark, cellular hypothecium, around which the loculi are arranged. Apart from the central foot the stromata are unattached, lying free on the leaf surface. In old stromata the asci above the foot break away, leaving a cavity, so that the loculi have the appearance of being arranged in a circle around a sterile centre.

Covering membrane black, carbonaceous, radiating in structure at margin, rugose. Diameter of a single stroma is $700-1000\ \mu$; height, excluding foot, $200-270\ \mu$.

Asci paraphysate, briefly pedicellate, eight-spored, $70-100\ \mu \times 30-45\ \mu$, ovate, thick-walled round apex, with conglobate spores when immature; later becoming more elongated, clavate, with distichous spores. Paraphyses linear, about $3.5\ \mu$ thick. Spores two-celled, almost black, opaque, slightly constricted, ellipsoid, upper loculus slightly larger, $30-33\ \mu \times 13.5-15\ \mu$.

Polyrhizon bewsii Doidge, nov. sp.

Stromata amphigena, orbicularia, atra, carbonacea, circ. 1 mm. diam., centro affixa, e 1-pluribus ascomatibus circinantibus concreta. Ascomata partialia, pede centrali $80-160\ \mu$ cr., epidermide innata, versus marginum radiato-contexta, $700-1000\ \mu$ diam., $200-270\ \mu$ alto, loculis rotundatis, immersis. Asci paraphysati, clavati, breviter pedicellati, octospori, $70-100\ \mu \times 30-45\ \mu$, paraphysibus linearibus, $3.5\ \mu$ cr. Sporae didymae, brunneae, opacae, leniter constrictae, elongatae, loculo supero paullo majore, $30-33\ \mu \times 13.5-15\ \mu$.

Hab. in foliis *Elaeodendri aethiopici*, Natal, 1.9.17, leg. Bews et Doidge [10087]. et [11592].

11. *Placoasterella rehmi* (P. Henn.) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 237.

Syn. *Asterella rehmi* P. Henn., Engl. Bot. Jahrb. XVII, p. 114; Sacc. Syll. Fung. XI, p. 257.

On *Aloe arborescens*, Ripplemead, Dohne, Stutterheim Dist., 25.2.15, Bell Edmonds [8899].

On *Aloe mitriformis*, Montague Baths, December, 1915, Pole Evans [9417].

On *Aloe natalensis*, Botanic Gardens, Maritzburg, 8.4.11, Pole Evans [1440].

On *Aloe* sp., New Hanover, Natal, 9.9.13, V. d. Bijl [8892].

This fungus was originally described as occurring in Abyssinia on *Aloe abyssinica* and *Aloe maculata*.

Aerial mycelium not very copious, consisting of brown hyphae, $3.5-5\ \mu$ thick, very tortuous, branched, and anastomosing. Stromata scattered or confluent in small groups, either round, $150-200\ \mu$ diam., or more frequently elliptic, $200-280\ \mu \times 120-150\ \mu$; in the latter case straight or curved; when two or three are confluent the stroma often appears to be forked; dehiscing by an irregular, round, or elongated fissure.

The cuticle of the leaf is stained with a red pigment where it has been attacked by the fungus, and the discoloration spreads into the palisade cells. The discoloured parts of the leaf tissue are swollen, so that the stromata lie on round, reddish or brown blisters, which are up to 5 mm. diam., and which are often so numerous as to become confluent.

Hypostroma epidermal, filling certain of the epidermal cells with dark hyphal balls, especially under the centre of the superficial fruiting bodies; mycelial strands also penetrate between the palisade cells.

Fruiting body usually unilocular, 60–80 μ high, with a thin black outer wall. Asci oval to clavate, paraphysate, eight-spored, apedicellate, thick-walled round apex, staining brick red with iodine, 36–40 $\mu \times 22\frac{1}{2}$ –25 μ . Spores brown, two-celled, constricted ellipsoid, cells almost equal, upper loculus somewhat broader, 18–23 $\mu \times 8$ –10 μ .

12. *Hysterostoma orbiculata* Syd.

Ann. Myc. XIII (1915), p. 239.

Syn. *Dothidasteromella orbiculata* Syd., Ann. Myc. X (1912), p. 41.

On *Olea verrucosa*, Wellington, C.P., 18.11.10, Doidge [1031]; Port Elizabeth, 17.10.09, West (immature) [1870].

In renaming this fungus, Theissen and Syd. (*loc. cit.*) remark that the species has been described from insufficient material, and that the diagnosis could be much improved after studying well-developed specimens.

There is in the National Herbarium abundant material of the same collection as the type [1031], and much of this is in excellent condition. I am, however, only able to add a few details to the description cited above.

Stromata usually epiphyllous, less commonly hypophyllous, circular in outline, dull black, 4–6 mm. in diameter, carbonaceous; the surface is rough and traversed by deep fissures or clefts. Each stroma is surrounded by a radiating fringe of hyphae, which are septate; 4–6 μ thick, and run parallel to one another. These hyphae are, as a rule, not branched, and are often fused by their lateral walls into hyphal strands, but are not compacted into a stroma.

The central part of the stroma consists of numerous loculi, which are irregularly arranged; they are round to irregular in shape and very closely crowded, 250–300 μ in diameter. The lateral walls are almost perpendicular, the total height of the ascostroma being 240–270 μ . The outer covering is radial in structure, and it breaks down irregularly at maturity.

There appear to be no stomata on the upper surface of the leaf of *Olea verrucosa*, but there are at intervals folds or clefts in the cuticle similar to those beneath which the guard cells are formed on the lower surface. The hypostroma of the fungus is found in the epidermal cells, between the epidermis and the cuticle and in the thickness of the cuticle itself; here it is pseudo-cellular and dark brown. There is also an almost continuous layer of colourless, interwoven hyphae lying between the epidermis and the palisade cells and penetrating into the upper part of the latter. The dark-coloured hypostroma breaks through the leaf, often at the clefts mentioned above; the cuticle is split irregularly in several directions, and through the fissures thus formed the hypostromal tissue grows and produces the fruiting bodies, the hypothecium being in direct connection with the hypostroma at several points under each loculus.

The hypothecium is brown, similar in texture to the hypostroma in the epidermal cells and cuticle, but less dense; it is about 90–100 μ high in the centre of each loculus, where it forms an irregular cushion, on which the asci are borne, and becomes much thinner at the periphery, measuring about 45 μ . Asci elongated, club-shaped, paraphysate, eight-spored, thick walled round the apex, 75–140 $\mu \times 16$ –32 μ . Paraphyses numerous, filiform, 2–3 μ thick, becoming more or less conglutinate at the tips and forming an epithelial layer. The asci do not react to iodine, but stain a brick-red colour. Spores usually distichous, oblong, medially uniseptate, brown, thick walled, 30–34 $\mu \times 12$ –15 μ , upper loculus very slightly broader and more broadly rounded than the lower.

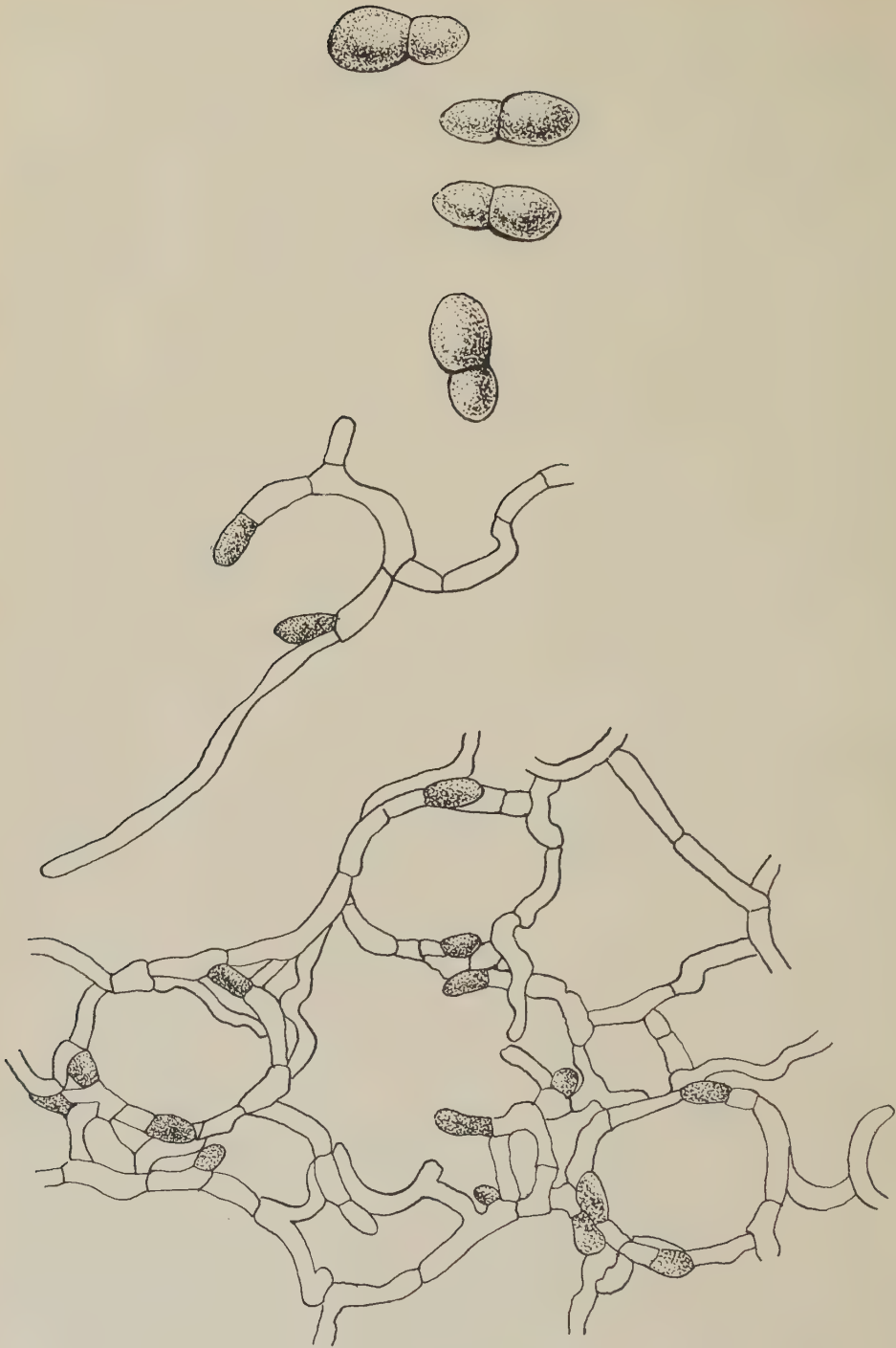


Fig. 2.—Mycelium and spores of *Isipingu areolata*.

13. *Isipinga* Doidge, nov. gen. *Polystomellacearum*.

Mycelium superficialum, ramosum, septatum, hyphopodiatum. Stromata superficialia ex hypostromate subcuticulari oriunda, pluries affixa. Loculi inordinate dispositi, rotundati vel elliptici (non lineares). Asci paraphysati, octospori. Sporae phaeodidymae.

This genus differs from *Hysterostoma* Theiss. in the presence of a well-developed aerial mycelium, and from *Asterodothis* in the absence of a central column or foot.

Isipinga areolata n. sp.

On leaves of *Euclea natalensis*, Isipingo Beach, Natal, 21.5.17, Doidge [10153]; 13.5.13, Doidge [6647]; near Durban, Natal, 25.5.97, Medley Wood [9520] (Wood No. 6447); 25.5.15, Doidge [8986]; 13.1.18, V. d. Bijl [11363].

Hypophyllous, usually near the reflexed leaf margin, less frequently scattered over the whole under-surface of the leaf, forming circular, dull-black areas, 5–15 mm. diam., often coalescing and forming irregular black blotches, especially along the leaf margins; stromata scattered and visible as small denser black points.

Aerial mycelium well developed, hyphae fuscous, 3.5–5 μ thick, branching freely and anastomosing to form regular, circular, or slightly oval areolae, 30–50 μ diam.; hyphopodia unicellular, darker than the hyphae, ovate or ellipsoid, straight or curved, 8–10 μ \times 5 μ . Stromata scattered, circular or oval, opaque black, 300–350 μ diam. or about 400 μ \times 240 μ , formed of radiating cells; arising from a subcuticular hypostroma which breaks through the cuticle to form the stromata in the cavities above the sunken stomata; stromata attached to host at several points by dark brown or black fungous pegs, which are up to 20 μ thick where they penetrate the cuticle; height of fruiting body is 80–100 μ , each stroma containing several round to irregular loculi; the dark covering membrane slopes gradually towards the leaf surface at the circumference of the stroma. Loculi dehisce at maturity by irregular fissures in the covering membrane.

Paraphyses fairly numerous, hyaline, linear, about 3 μ thick, slightly exceeding the asci. Asci eight-spored, ovate or broadly ellipsoid, thick walled round apex, 50–65 μ \times 33–40 μ , not reacting to iodine, but staining a sort of brick-red colour. Spores tristichous or conglobate, brown, two-celled, 27–32 μ \times 13–13.5 μ , constricted, upper loculus larger.

Isipinga areolata Doidge, n. sp.

Mycelium hypophyllum, bene evolutum, ramosum, areolatum ex hyphis 3.5–5 μ crassis, anastomosantibus, hyphopodiis continuis, ovatis v. ellipsoideis, rectis v. curvatis, 8–10 μ \times 5 μ , compositum. Stromata sparsa, rotundata v. elliptica, atra, opaca, 300–350 μ diam.; v. elliptica, circ. 400 μ \times 240 μ , radiatim contexta, hypostromate subcuticulare oriunda, pluries affixa. Loculi inordinate dispositi, 80–100 μ alti. Asci octospori, ovati vel late ellipsoidei, 50–65 μ \times 33–40 μ , paraphysate; paraphysibus filiformis, hyalinis, 3 μ crassis. Sporae tristichae v. conglobatae, brunneae, 1-septatae, 27–32 μ \times 13–13.5 μ , constrictae loculo supero, paullo majore.

Hab. in foliis *Eucleae natalensis*, Isipingo, Natal, 21.5.17, leg. Doidge [10153].

14. *Isipinga contorta* Doidge.

Syn. *Dothidasteromella contorta* Doidge, Trans. Roy. Soc. of S.A. VIII, Part 3, 1920.

On leaves of *Trichocladus ellipticus*, Branders' High Forest, Victoria East, 14.8.15, V. d. Bijl [9462]; Pirie Forest, Kingwilliamstown, 8.7.19, Doidge [12298].

Forms small, dull-black, round, or irregular areas on upper surface of the leaves; the leaf tissues become discoloured in the neighbourhood of the fungus, right through to the lower epidermis. Aerial mycelium well developed, primary hyphae long, radiating, fuscous, 3–3.5 μ thick, with unicellular hyphopodia which are alternate or unilateral, subglobose, 6–7 μ diam.; between the radiating hyphae there is a densely interwoven mass of paler secondary hyphae which are very tortuous and crumpled, copiously branched, and anastomosing. Stromata scattered, opaque, black, 250–350 μ diam., with radiating structure, unilocular, attached at several points, and arising from a well-developed subcuticular hypostroma. Asci paraphysate, ellipsoid, or ovate, very briefly stipitate, straight

or curved, $55-80\ \mu \times 20-25\ \mu$; paraphyses numerous, linear, flexuose, or somewhat crumpled. Spores distichous or conglobate, 1-septate, slightly constricted, upper loculus broader, $16-20\ \mu \times 8-10\ \mu$.

15. *Polystomella caulicola* n. sp.

On stems of *Asparagus* sp., banks of Orange River, Aliwal North, 11.1.12, Pienaar [2093].

Stromata caulicolous, usually irregularly elliptic to linear in outline, elongated in a direction parallel with the stem axis, up to 8 mm. long, varying in width, $80-100\ \mu$ high; often confluent and quite irregular in outline, attached at many points; surface rough, dull black. Covering membrane black, carbonaceous, formed of radiating hyphae about $3.5\ \mu$ thick and consisting of numerous *Microthyrium*-like discs fused together at the edges; the membrane covers a number of flattened loculi which are $100-150\ \mu$ diam. and $80-90\ \mu$ high, and are separated by thin walled plectenchyma which are colourless or light brown. Hypothecium delicate, thin, colourless. Asci paraphysate, cylindrical-clavate, eight-spored, briefly pedicellate, $50-70\ \mu \times 18-20\ \mu$. Spores distichous, ellipsoid, hyaline, two-celled, very slightly constricted, cells sub-equal, $17-20\ \mu \times 6.8-5\ \mu$ (not quite mature).

Hypostroma well developed in the epidermis and penetrating into the sub-epidermal cells.

Polystomella caulicola Doidge, n. sp.

Stromata caulicola, elongata, usque 8 mm. longa, $80-100\ \mu$ alta, pluries affixa, membrana una radiato e cellulis $3.5\ \mu$ cr. contexta, carbonacea, ex pluribus quasi-Microthyriis conflata tecta, ex hypothecio epidermali oriunda. Loculi rotundati, $100-150\ \mu$ diam., $80-90\ \mu$ alti, hypothecio tenue, hyaline. Asci paraphysati, cylindracei v. clavati, octospori, breviter pedicellati, $50-70\ \mu \times 18-20\ \mu$. Sporae distichae, ellipsoidae, hyalodidymae, leniter constrictae, loculus subaequalibus, $17-20\ \mu \times 6.8-5\ \mu$ (vix maturis).

Hab. in caulibus *Asparagi* sp., Aliwal North, 11.1.12, leg. Pienaar [2093].

16. *Palawaniella* Doidge, nov. gen. *Polystomellacearum*.

Stromata superficialia, orbicularia, pluries affixa, hypostromate in epidermide bene evoluto, radiato-contexta, carbonacea; mycelio libero nullo; loculis e medio evoluto, plus minusve annulatim dispositis, sed discretis, rotundatis; hypothecium tenue; asci paraphysati, octospori; sporae phaeodidymae.

This genus differs from *Palawania* chiefly in the centrifugal development of the stromata, and in the epidermal, rather than sub-epidermal hypostroma. It differs from *Pleiomella* in the brown, two-celled spores; the loculi are less definitely arranged in concentric rings.

***Palawaniella nucleae* n. sp.**

On living leaves of *Euclea macrophylla*, Howiesons Poort, near Grahamstown, 12.7.19, Doidge [12375].

Stromata epiphyllous, scattered, round, 4-7 mm. diam., loculi developing centrifugally and arranged in more or less definite concentric circles; these show first of all as minute black points, which increase in size up to $160-500\ \mu$ diam.; in the centre the loculi are very closely crowded; towards the circumference they are more scattered, but in either case they are round to oblong, discrete, $80-90\ \mu$ high, adnate with their whole base to the substratum. The outer wall is radial in structure and splits at maturity by irregular stellate or, less frequently, longitudinal fissures.

Hypostroma well developed, formed of fuliginous hyphae which form compact balls in the epidermal cells; hyphae may often be traced running between the palisade cells and the epidermal cells, and so connecting adjacent loculi. There are no stomata on the upper surface of the leaf and the cuticle is not ruptured, the ascus-bearing stroma being connected with the hypostroma in the epidermal cells by numerous fine, colourless filaments, which penetrate the cuticle; these are about $1-1.5\ \mu$ thick. Hypothecium thin, colourless.

Asci paraphysate, eight-spored, very briefly pedicellate, clavate to ovate, thick walled at apex, $43-57\ \mu \times 23-27\ \mu$; they do not react to iodine. Paraphyses very numerous, hyaline, filiform $2.5-3\ \mu$ thick, slightly exceeding the asci. Spores distichous or conglobate, ellipsoid, two-celled, fuscous, later brown, very slightly constricted, cells almost equal, $20-21\ \mu \times 8.5-10\ \mu$.

Palawaniella eucleae Doidge, nov. sp.

Stromata ascophora epiphylla, superficialia, sparsa, 4-7 mm. diam., radiato-contexta; hypostromati epidermali; loculi numerosi, e medio evoluti plus minusve concentrice dispositi, sed discreti, rotundati v. elliptici, $160-500\ \mu$ lati, $80-90\ \mu$ alti; hypothecio tenue. Asci paraphysati, octospori, brevissime pedicellati, clavati v. ovati, ad apicem incrassati, $43-57\ \mu \times 23-27\ \mu$; paraphysibus numerosis, hyalinis, filiformis, sporae distichae v. conglobatae, ellipticae, medio septatae, brunneae, leniter constrictae, loculis subaequalibus, $20-21\ \mu \times 8.5-10\ \mu$.

Hab. in foliis *Eucleae macrophyllae*, Howiesons Poort, 12.7.19, leg. Doidge [12375].

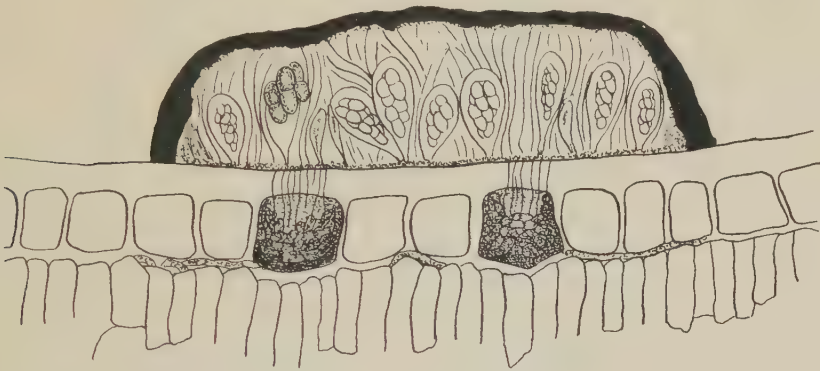


Fig. 3.—Section through locusus of *Palawaniella eucleae*.

17. *Pleiomastix Halleriae* n. sp.

On *Halleria lucida*, Louis Trichardt, 8.4.19, Putterill [11847]; Van Stadens Pass, C.P., 13.11.17, Doidge [10872]; Howiesons Poort, Grahamstown, 17.11.17, Doidge [10959]; Buccleuch, Natal, 17.7.18, Doidge [11585]; Howiesons Poort, 12.7.19, Doidge [12384].

On *Halleria elliptica*, Kentani, 4.12.15, Pegler (Pegler 2348) [9163].

Stromata epiphyllous, superficial, scattered, round, up to 3 mm. diam., obscurely brown, $100-115\ \mu$ high, attached at many points, radiate in structure, with an opaque, rugose covering membrane $30-45\ \mu$ thick; hypothecium brown, $30-36\ \mu$ thick, loculi numerous, densely crowded in concentric circles, but discrete, round, $190-250\ \mu$ diam., or becoming oval by crowding and then $250-280\ \mu \times 160\ \mu$. Hypostroma epidermal, but occasionally, in centre of stroma, more deeply seated and invading the palisade cells. Asci ovate, $50\ \mu \times 26-33\ \mu$ or clavate, $66-70\ \mu \times 20-23\ \mu$, thickened at apex, eight-spored; paraphyses hyaline, linear, about $1.5\ \mu$ thick, soon disappearing. Spores distichous or tristichous, at first equally or sub-equally 1-septate, constricted, later muriform, usually transversely 5 (rarely) 7-septate, and with a longitudinal septum running the length of spore, rarely constricted at secondary septa; septa very delicate, plasma granular, hyaline (mature?) $22-24\ \mu \times 9-10\ \mu$. Asci stain brick-red with iodine.

Pleiomastix Halleriae Doidge, nov. sp.

Stromata ascophora superficialia, sparsa, rotundata, usque 3 mm. diam., obscure brunnea, $100-115\ \mu$ alta, radiato-contexta, pluries affixa; hypostromate epidermali; strato tegente opaco, $30-45\ \mu$ crasso; loculi numerosi, dense concentricque dispositi, sed

discreti, 190–250 μ diam., vel elliptici, 250–280 $\mu \times 160 \mu$. Asci ovati, 50 $\mu \times 26$ –33 μ , vel clavati, 66–70 $\mu \times 22$ –23 μ , ad apicem incrassati, octospori, paraphysati; paraphysibus filiformis, mox mucosis praesentibus. Sporae distichae v. tristichae, oblongae, utrinque rotundatae, hyalinae (an semper?) medio v. paullo supra medium septatae, deinde transverse 5, rare 7 septatae, septis tenuissimis, cellulis pluribus v. omnibus septo longitudinali divisus, plasmate granuloso, 22–24 $\mu \times 9$ –10 μ .

Hab. in foliis *Halleriae lucidae*, Louis Trichardt, 8.4.19, leg. Putterill [11847].

18. **Diplochorella amphimelaena** (Mont.) Theiss. and Syd.

Ann. Myc., 1914, p. 277.

Syn. *Dothidea amphimelaena* Mont.

Ann. Sc., Nat. II, Ser. t. XX, p. 372. Syll. Crypt., p. 222.

Homostegia amphimelaena Sacc. Syll. Fing. II, p. 650.

Phyllachora osyridis Cke., Grevillea XIII, p. 64.

Dothidella osyridis Berl. et Vogl., Syll. Fung. IX, p. 1038.

Dothidella osyridis var. *tassiana* Sacc., Syll. Fung. XIV, p. 676.

Microcyclus osyridis Sacc., Ann. Myc. II, 1904, p. 165.

Microcyclus tassianus Syd., Ann. Myc. II, 1904, p. 165.

On *Osyris compressa*, Muizenberg, C.P., 1883, MacOwan (Rabh. Wint. Fung. Eur. 3562) [3902]; Port Elizabeth, 23.3.11, Doidge [1243]; St. James, Capetown, 10.12.11, Pole Evans [1982]; Kloof Neck, Capetown, 24.2.12, Doidge [2155]; Muizenberg, 12.4.12, Beardmore [2292]; Belmont Valley, Grahamstown, 15.11.17, Doidge [10954]; Kalk Bay, January, 1918, Potts [11302].

Compound stromata, circular, 2–3 mm. diam., forming flat, raised discs on both sides of the leaf, with almost vertical edges, silver grey on the surface, thickly beset with erumpent punctiform, dull black bodies about 50 μ diam., which eventually cover the whole surface. The densely crowded loculi develop under the epidermis—the apex of each separately rupturing the epidermis—and become somewhat raised above it. Gradually the part of the epidermis intermediate between the apices of the loculi disappears and the surface becomes altogether black. The leaf is normally 500–550 μ thick, but through the action of the fungus on both leaf surfaces it is often up to 1300 μ thick. The central leaf tissue is colourless and free from fungous stroma to a thickness of 700 μ ; above and below this the stromatic layer develops, which is again differentiated into two layers, the outer composed of the loculi and the inner of the basal hyphal stroma. The first consists of closely crowded, perithecioid-like loculi, which are 120 μ high and 85–95 μ diam., and which are more or less connected laterally. From the base of the loculi the hyphae of the vegetative stroma run vertically inwards, forming a fairly sharply defined stromatic plate 120–170 μ thick. The loculi are typically composed of grey-brown, laterally compressed cells which are 14–15 μ long, 5 μ thick, and 8–9 μ broad, and are in close contact by their flat sides. These hyphae sometimes penetrate inwards in more or less compact strands, but only to a limited depth, and the intermediate leaf tissue is not destroyed. Towards the base of the loculi the greater part of the flat cells become polyhedral or regularly elliptic and somewhat smaller and form a sort of wall round the loculi consisting of a few concentric layers of cells; they also fill up the spaces between the loculi; the cells are dark brown and thick walled. There is apparently no stromatic connection between the stromata on the upper and lower leaf surfaces.

Asci apophysate, basal, short cylindrical, 35 $\mu \times 12 \mu$, apedicellate, eight-spored. Spores polystichous, hyaline, two-celled, 12–13 $\mu \times 4 \mu$, constricted at the septum; lower cell twice the length of the upper.

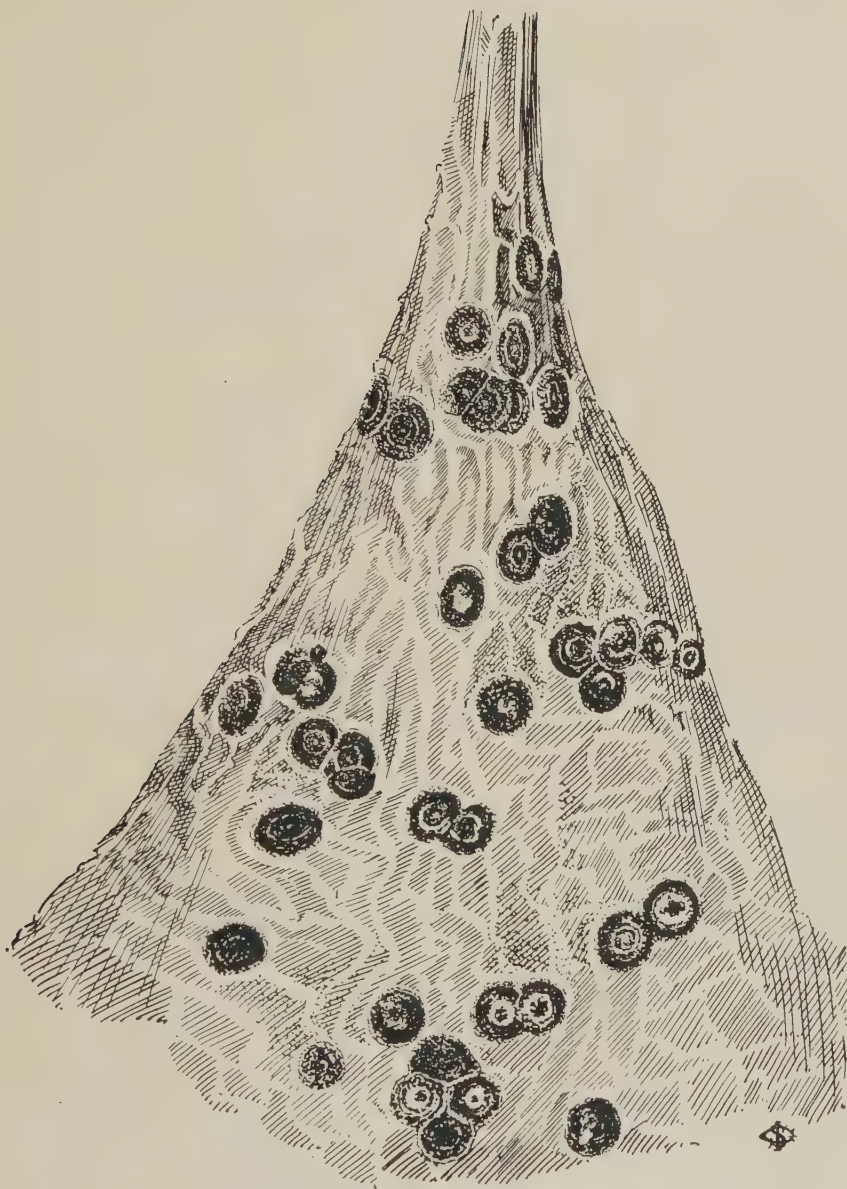


Fig. 4.—*Montagnella maxima*.

19. *Montagnella maxima* Mass.

Gardener's Chronicle, 1899, p. 291, c.i.e.; Syll. Fung. XVI, p. 630.

Ann. Myc. XVI, p. 630; Ann. Myc. XIII (1915), p. 638, Fig. 4.

On *Aloe ferox*, Port Elizabeth, 24.3.12, Doidge [2274]; Uitenhage, 15.5.12, Pienaar [2496]; Graaff-Reinet, 1.4.12, Burt-Davy [5156].

On *Aloe platylepis*, Port Elizabeth, 23.3.11, Doidge [1312].

This fungus forms large raised galls about 1 mm. high; on both sides of the leaf, they are circular or oval and up to 1 cm. diam. The stroma breaks through the epidermis, forming a number of little furrows which are arranged in numerous concentric circles. The vegetative stroma extends perpendicularly downwards into the gall tissue, filling the intercellular spaces with smooth, light brown hyphae $3\frac{1}{2}$ –4 μ thick; before they break through the epidermis these become collected together and form a thick compact weft, on which are formed in groups the narrow, almost free loculi. These in section are 135 μ high and 100 μ diam., the stromatic base of each group being 160–240 μ thick. Asci basal, paraphysate, broadly clavate to oval, very briefly pedicellate, 58–68 $\mu \times$ 30–40 μ ; spores brown, tristichous, oblong, 30 $\mu \times$ 6–8 μ , four-celled, constricted in the middle, rounded at both ends, straight.

20. *Elmerococcum peglerae* (Pole Evans) Doidge.

Syn. *Montagnella peglerae* Pole Evans, Ann. Bolus Herb. II, p. 5.

On leaves of *Myrsine melanophleos*, Kentani, 3.4.12, Pegler [2206]; May, 1913, Pegler [6620].

Stromata hypophyllous, black, punctiform, not more than 0.5 mm. diam., attached to the leaf by a central foot which breaks out through a stoma. The central foot gives rise to a thick basal cushion of sterile plectenchyma, on which are borne the small bolster-shaped ascostroma and one or two sub-spherical pycnidia, both being flattened laterally by contact. The stroma is often surrounded by a short sparse fringe of fuscous hyphae, which are septate and 3–3.5 μ thick. Ascostroma 300–430 $\mu \times$ 200–270 μ and about 80–90 μ high, unilocular; wall consisting of polyhedral plectenchyma. Asci paraphysate, oval to clavate, very briefly pedicellate, 60–70 $\mu \times$ 23–27 μ ; paraphyses not numerous, filiform, exceeding the asci. Spores distichous, hyaline, 3-septate, clavate to ellipsoid, not constricted, 27–30 $\mu \times$ 9–10 μ . Pycnidia 160–200 μ diam.; conidia very numerous, minute, bacilloid.

Elmerococcum peglerae Doidge, nov. sp.

Stromata erumpenti-superficialia, centro affixa, orbicularia v. elliptica, usque 5 mm. diam.; ascostroma unica et pycnidia unica vel dua in quaque stromati aggregata. Ascostromata nigra, perithecioidea, elliptica 300–430 μ longa, 200–270 μ lata, 80–90 μ alta. Asci ovati vel clavati, paraphysati, breviter pedicellati, 60–70 $\mu \times$ 23–27 μ . Sporae distichae, hyaline, 3-septatae 27–30 $\mu \times$ 9–10 μ . Pycnidia rotundata 160–200 μ diam.; conidiis minutis bacillaribus.

Hab. in foliis *Myrsine melanophleos*, Kentani, 3.4.12, Pegler [2206]; May, 1913, Pegler [6620].

21. *Rosenscheldia horridula* n. sp.

On living leaves of *Olea capensis*, Umgeni Beach, Durban, 4.6.12, Pole Evans [3149]; East London, 19.7.19, Doidge [12411].

On *Olea woodiana*, East London, 24.11.17, Doidge [10903].

Stromata usually hypophyllous, less frequently epiphyllous, very numerous, but not large, up to 2 mm. diam. Often larger, irregular stromata are formed by confluence.

In the intercellular spaces under the epidermis the hyphae are colourless and closely packed, passing over into a darker coloured mass of round-polygonal cells 5–6.5 μ diam. This layer of dark, thick-walled cells is rather irregular and here and there penetrates deeper into the leaf tissues. From this stromatic base arise very numerous, closely crowded, cylindrical or club-shaped bodies 200–240 μ high, 96–160 μ thick at the base

160–200 μ thick at the apex. This column has the same prosenchymatous structure as the basal stroma. In the upper, broader part of each there is a single loculus sunk in the stroma; this has no separate wall, but is covered by the polygonal-celled hyphal web of the stroma column. The cells of this covering layer are larger than those at the base, being 7–10 μ diam.

In this species of *Rosenscheldia* the sterile part of the column is very short, the loculus being sub-spherical 100–150 μ diam. Asci basal, clustered, eight-spored, paraphysate, narrow-clavate, thickened round apex, 55–70 $\mu \times 16$ –17 μ . Paraphyses numerous, filiform. Spores distichous, four-celled, fuscous, clavate, 20–22 μ long, 6–6.5 μ thick at the broad end.

Rosenscheldia horridula Doidge, nov. sp.

Stromata plerumque hypophylla, minuta, usque 2 mm. diam., v. confluenta majores, columnata, columnis cylindraceis v. clavatis, dense aggregatis, 200–240 μ altis, base 96–160 μ , apice 160–200 μ crassis. Loculi apicales singuli in quaque columna, stromate apicale tegentes, 100–150 μ diam. Asci paraphysati, octospori, clavati, ad apicem incrassati, 55–70 $\mu \times 16$ –17 μ ; paraphysibus numerosis, filiformis. Sporae distichae, 3-septatae, fuscae, clavatae, 20–22 $\mu \times 6$ –6.5 μ .

Hab. in foliis *Oleae capensis*, Durban, 4.6.12, leg. Pole Evans [5149].

22. *Auerswaldia examinans* (M. et B.) Sacc.

Syll. Fung. II, p. 626.

Syn. *Dothidea examinans* M. et B.—Bl. javan, 520.

Sphaeria examinans Mont. et Berk.—Hooker's Lond. Journ. Bot. I, p. 156.

On bark of old seedling citrus tree, Krantzklouf, Natal, 7.4.14, Bell [7733].

Auerswaldia examinans was originally described as occurring on the bark of a tree in Java. The South African specimen agrees with the description given in the *Annales Mycologici* (XIII, 1915, p. 298), except that the loculi are somewhat larger.

The bark is thickly beset with the erumpent, dull black, tuberculate stromata in all stages of growth, from the youngest which are punctiform to the mature columns with a length of 800 μ . The surface is rough, granular, covered with the somewhat mammillate protruding apices of the loculi.

The stroma develops under the bark, spreading considerably, and breaking through at several points develops the stromatal columns in which the loculi are formed. The hyphae forming the column are pendicular to the hypostroma, towards the apex becoming indistinctly cellular. In the young fruiting bodies only the hypostroma and the outer layer of the column is dark coloured. The loculi lie in the upper part of the column, and are 140–160 $\mu \times 120$ –150 μ , circular to ellipsoid, and sunken in the stroma, the latter being raised in a series of minute peaks over the apices of the loculi. The loculi are not ostiolate, dehiscing by the rupture of the outer stromatic wall. Asci basal, clavate-cylindrical, 65 $\mu \times 18$ μ , with a short, broad foot 12 μ long. Spores distichous, brown, one-celled, oblong-ellipsoid, rounded at both ends, 20–24 $\mu \times 10$ –11 μ .

23. *Dothidina disciformis* (Wint.) Theiss. and Syd.

Ann. Myc. XIII (1915), p. 304.

Syn. *Auerswaldia disciformis* Wint.—Hedwigia XXIII, 1884, p. 170; Syll. Fung. IX, p. 1033.

On leaves of *Myrica* sp., near Capetown, 1883, MacOwan (Rabh. Wint. Fung. Eur. 3063) [3403]; Krantzklouf, Natal, 14.8.14, V. d. Bijl [8396]; Uganda, March, 1916, Dummer [11986].

Stromata on both sides of the leaf, round or irregular, often angular, 2–5 mm. broad, forming black, comparatively smooth cushions, raised 200–300 μ above the leaf surface. The epidermis, which is filled with stroma, at first covers the true stroma, but later it becomes torn and pushed back, and is also torn away from the stroma, with which it was

at first united. It then surrounds the free erumpent fruiting bodies, being torn into broad black flaps. The inner part of the stroma is comparatively light coloured, but consists of thick-walled hyphae, 6–10 μ broad. Loculi crowded, spherical or spherical-ovate, 120–160 μ diam., not reaching the base of the stroma, without a true wall. Paraphyses filiform. Asci cylindrical, rounded above, narrower at the base, 100–135 $\mu \times$ 14–16 μ . Spores obliquely monostichous or almost distichous up to eight in an ascus, elliptic, one-celled, olive brown, 17–19 $\mu \times$ 8–9 μ .

24. **Parastigmatea** Doidge, nov. gen. *Stigmateacearum*.

Omnia ut in *Stigmatea*, sed sporae hyalinae, continuatae.

Parastigmatea nervisita n. sp.

On leaves of *Stephania hernandifolia*, Maritzburg, Natal, 26.6.11, Doidge [1656]; 6.4.14, Doidge [8352].

Ascomata epiphyllous, minute, dull black, punctiform, circular, 240–300 μ diam., discrete, but in small groups on main and lateral veins, 80–90 μ high, smooth, remaining covered by the cuticle. Basal membrane brown, about 10 μ thick, composed of concentric layers of compressed hyphae. Covering membrane radial in structure, composed of sinuous hyphae, 3–3.5 μ thick, arched in centre, flat at edges, 6–7 μ thick, dehiscing by a circular central pore; central cavity containing asci about 150 μ diam. Asci paraphysate, ovate or broadly ellipsoid, thick-walled, eight-spored, 50–53 $\mu \times$ 26.5–30 μ . Spores distichous or conglobate, hyaline, sub-clavate or somewhat piriform, rounded at both ends, continuous, 20–24 $\mu \times$ 8–10 μ .

Parastigmatea nervisita Doidge, nov. sp.

Ascomata epiphylla, minuta, atra, rotundata, in nervibus insidentia, 240–300 μ diam., 80–90 μ alta, laeves, cuticulare tecta, radiatim e hyphis undulatis 3–3.5 μ crassis, contexta. Asci paraphysati, ovati vel late ellipsoidei, 8-sporei, 50–53 $\mu \times$ 26.5–30 μ . Sporae distichae v. conglobatae, hyalinae, continuatae, subclavatae v. sub-piriformae, utrinque rotundatae, 20–24 $\mu \times$ 8–10 μ .

Hab. in foliis *Stephaniae hernandifoliae*, Maritzburg, 26.6.11, et 6.4.14, leg. Doidge [1656] et [8352].

25. **Perischizon oleifolium** (Kalch and Cke.) Syd.

Ann. Myc. XII (1914), p. 265, XII (1915), p. 269.

Syn. *Dothidea oleifolia* Kalch et Cke., Grevillea IX (1880), p. 31.

On *Olea capensis*, 9.1.14, Kirstenbosch, C.P., Pearson [7374].

On *Olea laurifolia*, 21.6.16, Malalane, Eastern Transvaal, Hall [9749].

Stromata amphigenous, scattered or crowded, circular, raised, $\frac{1}{2}$ – $\frac{3}{4}$ mm. diam., with a central foot 100–200 μ diam. penetrating into leaf tissues. Surface rough, lumpy, with a single (occasionally double) peripheral wall, beset laterally as well as at the base with bristly, brown, truncate septate hyphae, 100 μ long, 5–8 μ thick, which later disappear. Stroma hard in texture, dark, prosenchymatous, composed of parallel hyphae. The loculi are sunken in the periphery and coalesce to form a circular hymenium, the stromatal cover becoming mucilaginous at maturity and disappearing. Asci clavate, thick-walled round the apex, 90–115 $\mu \times$ 28–38 μ , eight-spored, embedded in mucilage. Paraphyses simple, thick, clavate at the apex, and 3–4 μ broad, light brown. Spores distichous, ellipsoid-oblong, brown, 26–34 $\mu \times$ 11–14 μ , two-celled, constricted, abruptly rounded at both ends; upper cell somewhat broader than the lower.

26. **Phragmodothella nervisequens** n. sp.

On leaves of *Burchellia capensis*, Van Stadens Pass, 7.7.18, Pole Evans [11446].

Stromata amphigenous, but mostly hypophyllous, forming elongated, raised, rusty-brown streaks, up to 1 cm. long and 1 mm. broad, on mid-rib and main lateral veins; smaller, punctiform, elongated, or branched on smaller veins. Stromata developed under

the epidermis, causing a gall-like hypertrophy of the leaf tissues, later becoming crumple; 120–160 μ high, the inner part of the stroma being composed of compact brown cells 3–5 μ diam., prosenchymatous between the loculi, and with a darker, roughened crust. Loculi numerous, immersed, sub-spherical, 80–100 μ diam. Asci aparaphysate, eight-spored, clavate or ellipsoid, thick-walled round apex, with a short foot, 45–60 $\mu \times$ 20–23.5 μ . Spores hyaline, distichous, 3-septate, oblong or somewhat clavate, slightly constricted at the centre, 18–20 $\mu \times$ 5–6.5 μ .

Phragmodothella nervisiquens Doidge, nov. sp.

Stromata amphigena, plerumque nervisequentes hypophylla, nervis majoribus usque 1 cm. longa et 1 mm. lata; nervis secundariis minores punctiforma, elongata v. ramosa; erumpentia dothideodea, 120–160 μ alta. Loculi numerosi, immersi, suborbiculares, 80–100 μ diam. Asci aparaphysati, octospori, clavati v. ellipsoidei, apice incrassati, breviter pedicellati, 45–60 $\mu \times$ 20–23.5 μ . Sporae hyalinae, distichae, triseptatae, oblongae v. subclavatae, medio leniter constrictae, 18–20 $\mu \times$ 5–6.5 μ .

Hab. in foliis *Burchelliae capensis*, Van Stadens Pass, 7.7.18, leg. Pole Evans [11446].



Fig. 5.—*Phragmodothis asperata*.

27. *Phragmodothis asperata* Syd.

Ann. Myc. XIII (1915), p. 345.

On the stem of *Euphorbia schintzii*, Wagenpadsnek, Pretoria Dist., 26.12.11, Pienaar [2159]; 31.12.13 [7353].

Stromata only growing in the outer layers of cells and becoming apparently quite superficial through the rupture of the periderm, almost spherical, 1½–3 mm. diam., 1½–2 mm. high, black, surface much wrinkled and cracked. Interior of stroma brown, the base and periphery being dark, opaque, formed of perpendicular, ascending hexagonal cells 15–19 μ diam. Loculi elliptical, 250 $\mu \times$ 200 μ , sunken under the periphery, often apparently free through the crumbling away of the stroma surface. Asci clavate, thick-walled, 140–200 $\mu \times$ 16–32 μ , 6–8 spored. Spores distichous or obliquely monostichous, oblong, four-celled, narrowed towards each end, but not pointed; straight, or one side straight and the other convex, verrucose at maturity. Paraphyses wanting.

28. *Trabutia evansii* Theiss. et Syd.

Ann. Myc. XIII (1915), p. 352.

On *Ficus* sp., Lourenço Marques, Portuguese East Africa, May, 1909, Howard [668].

Stromata only epiphyllous, on inconspicuous yellowish or brownish, discoloured spots, small, circular, 1 mm. diam., usually more or less regularly arranged in groups $\frac{1}{2}$ –1 cm. diam., but seldom becoming confluent. Not infrequently these groups are so numerous that they run together, and the whole leaf surface is more or less evenly and thickly beset with the small stromata. Stromata convex, almost hemispherical, unilocular, between the cuticle and the epidermis, composed of grey brown, vertical, parallel hyphae 4–5 μ diam. Clypeus opaque, 50–80 μ thick, loculus 300–450 μ diam., 150–240 μ high, with a wall 15–18 μ thick composed of delicate brown hyphae and concentric in structure. Asci cylindrical with monostichous spores, or clavate with distichous or somewhat conglobate spores (in the latter case the spores are often oblique or transverse), 70–90 $\mu \times$ 10–16 μ , eight-spored. Paraphyses numerous. Spores ellipsoid, abruptly rounded at both ends, continuous, hyaline, 11–14 $\mu \times$ 8–9 $\frac{1}{2}$ μ .

29. *Trabutia ficuum* (Niessl.) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 352.

Syn. *Phyllachora ficuum* Niessl. Hedwigia XX. 1881, p. 99. Syll. Fung. II, p. 598.

On *Ficus* sp. Portuguese East Africa, 24.5.1908, Howard [520].

On *Ficus howardiana*, Lourenço Marques, P.E.A., 30.8.1909, Howard [719].

Stromata epiphyllous, shiny black, small, $\frac{1}{2}$ –1 mm. diam., raised, irregular, between the cuticle and the epidermis, becoming flat at the edge. In the centre there are a few loculi, 120–140 μ high, with opaque covering stromatal layer about 30 μ thick, the inner part of the stroma is lighter brown. Loculi flattened-spherical or lenticular, from 220 μ diam. and 100 μ high, to 320 μ diam. and 115 μ high. Asci paraphysate, cylindrical-clavate, 55–65 $\mu \times$ 14–18 μ , eight-spored. Spores hyaline, continuous, monodistichous, oval to ellipsoid, rounded at both ends, 11–13 $\mu \times$ 6 $\frac{1}{2}$ μ .

30. *Trabutia nervisequens* (Lingelsh) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 353.

Syn. *Phyllachora schweinfurthii* P. Henn., var. *nervisequens* Lingelsh, Engl. Bot. Jahrb. XXXIX, 1907, p. 604.

On *Ficus* sp., Umgeni, near Durban, 21.3.10, Doidge [854]; Malvern, Natal, 28.12.11, Doidge [1994]; Winkle Spruit, Natal, 29.1.12, Pole Evans [2019]; Port Shepstone, Natal, 15.10.12, Pole Evans [5608]; Amanzimtoti, 14.6.14, Franks [7813].

This fungus was originally described on *Ficus hochstetteri*, var. *glabrior* in Abyssinia. It appears to occur quite commonly on the Natal coast.

Stromata epiphyllous, developed on inconspicuous yellowish coloured spots, chiefly along the mid-rib and lateral veins, being elongated in the direction of the vein and more or less confluent. Small stromata only 1 mm. long, larger ones up to 2 cm. long, very slightly shiny, between the cuticle and the epidermis, with one or many loculi, flat, somewhat wavy. The inner part of the stroma is prosenchymatous, composed of brown, parallel hyphae, perpendicular to the leaf surface, and 7–9 μ thick. Loculi lenticular, 400–600 μ diam., 250–300 μ thick. Locular wall comparatively stout, 12–18 μ thick, light brown, composed of numerous concentric layers of very delicate hyphae. Clypeus 40–60 μ thick, stout, opaque. Asci cylindrical, stipitate, paraphysate, 75–110 $\mu \times$ 11–14 μ . Spores usually monostichous, broadly ellipsoid, continuous, hyaline, 12–16 $\mu \times$ 8–10 μ .

On the surface of young stromata a conidial layer is often developed, which produces hyaline, filiform, crumpled conidia.

Var. *robusta* Doidge.

On *Ficus* sp., Port Elizabeth, 20.6.19, Gunn [12248].

Differs from the type in the thickness of the stroma and in the form and size of the loculi. Stroma 400–450 μ high, loculi sub-spherical, 330–370 μ diam., 300–400 μ high.

31. *Catacauma dalbergiicola* (P. Henn.) Th. et Syd.

Ann. Myc., XIII (1915), p. 388.

Syn. *Phyllachora dalbergiicola* P. Henn., Hedwigia XXXVI, 1897, p. 224; Syll. Fung. XIV, p. 664.

On leaves of *Dalbergia armata*, Barberton Dist., August, 1906, Pole Evans [588]; Stella Bush, Durban, 11.7.11, Doidge [1662]; Verulam, Natal, 3.7.13, Pole Evans [6808].

The type specimen is on leaves of *Dalbergia variabilis* and was collected in Brazil. The South African specimens agree exactly with the description of the original, except in the size of the loculi, which are somewhat smaller.

Epiphyllous, taking different forms on different leaves, sometimes very minute, sometimes producing round-angular stromata up to 1½–2 mm. diam., convex, somewhat shiny, between the epidermis and the palisade cells. Clypeus epidermal, opaque, about 35 μ thick, the inner part of the stroma being formed of vertical, parallel, light rusty-brown prosenchyma. Loculi sunken in the stroma, one or more according to the size of the stroma, 240–300 μ diam. and 180–200 μ high (in the original description 360–440 μ diam.), with a thin wall. Asci clavate, paraphysate, 60–70 μ \times 16–20 μ . Spores distichous, oblong-ellipsoid, hyaline, continuous, 12–14 μ \times 6–7 μ .

32. *Catacauma Pterocarpi* Syd.

Ann. Myc. XIII (1915), p. 387.

Syn. *Phyllachora Pterocarpi* Syd., Ann. Myc., 1912, p. 40.

On *Pterocarpus angolensis*, Letaba Drift, Zoutpansberg Dist., 6.8.11, Doidge [1807]; Barberton, 22.8.12, V. d. Bijl [5132].

Stromata epiphyllous, scattered, small, irregularly circular, 1–2 mm. diam., shiny black, on pale leaf spots, slightly convex, with somewhat undulating surface. Clypeus epidermal, opaque; loculi with their bases on the palisade tissue, 1–6 in each stroma, flattened-spherical, closely appressed to the leaf tissue at the base, with thin brown walls, 350–450 μ diam., 240–300 μ high. The upper parts of the loculi are connected by thick stromatic tissue. Asci paraphysate, clavate-cylindrical, 60–80 μ \times 16–24 μ . Spores monostichous or distichous, hyaline, one-celled, elliptic, rounded at both ends, 14–18 μ \times 8–9 μ .

The spores of both specimens appear to be somewhat immature. Theissen and Sydow (*loc. cit.*) state that it is doubtful whether there is a working difference between this fungus and *Phaeostroma pterocarpi* Syd. with two-celled spores.

33. *Catacauma Peglerae* n. sp.

On leaves of *Eugenia capensis*, Kentani, 6.7.15, Pegler (Pegler No. 2340) [9099]; Umbogintwini, Natal, 9.5.13, Doidge [6636]; Scottsburgh, Natal, 5.7.13, Pole Evans [6841]; Warner Beach, Natal, 1.4.18, Bottomley [11667].

Stromata epiphyllous, 1–2 mm. diam., circular, often forming larger, irregular stromata by confluence. Central stroma often surrounded by a ring of secondary stromata at a distance of 2–5 mm. (radius), which may be small and discrete, or fuse to form a continuous ring. Stromata black, shining, somewhat conical or mammillate in section. Epidermal clypeus about 40 μ thick, black, opaque, the stroma lying in the cavity between the arched epidermal clypeus and the depressed and hollowed palisade tissue. Locular wall thin and very closely appressed to the palisade cells. Loculi flattened-hemispherical

or pear-shaped, 400–600 μ diam. and 350–500 μ high. The loculi are often connected by opaque black stromatic tissue about 150 μ thick. Asci paraphysate, eight-spored, clavate-cylindrical, 120–140 $\mu \times$ 17–20 μ , with a short foot, 10–13 μ long. Spores mono-distichous, one-celled, hyaline, oval to ellipsoid, 20–23 $\mu \times$ 12–13 μ .

Catacauma peglerae Doidge, nov. sp.

Stromata epiphylla, 1–2 mm. diam. v. confluendo majores, nonnunquam concentrice disposita, atra, nitidula, subconica, subepidermales. Loculi 400–600 μ diam., 350–500 μ alti, clypeo opaco, aterrimo, 40 μ crasso, parietibus tenuibus. Asci paraphysati, octospori, cylindraco-clavati, 120–140 $\mu \times$ 17–20 μ , breviter pedicellati. Sporae monostichae v. distichae, continuae, hyaline, ovatae v. ellipticae, 20–23 $\mu \times$ 12–13 μ .

Hab. in foliis *Eugeniae capensis*, Kentani, 6.7.15, leg. Pegler [9099].

34. *Catacauma grammicum* (P. Henn.), Theiss. et Syd.

Ann. Myc. XIII (1915), p. 382.

Syn. *Phyllachora grammica* P. Henn., in Flore du Bas et Moyen Congo in Ann.

Mus. du Congo, Vol. II, fasc. II, 1907, p. 98.

On leaves of *Ficus capensis*, Lemana, Zoutpansberg Dist., 14.8.11, Doidge [1829]; Kentani, C.P., 1.3.15, Pegler (Pegler No. 1993) [8884].

Stromata scattered, amphigenous, usually only on one side of the leaf, but occasionally an epiphyllous is found opposite to a hypophyllous stroma, following the nerves, forming dull black, linear streaks up to 7 mm. long and 0.8 mm. broad on a yellow brown leaf spot; from these short lateral streaks radiate or form thin connecting branches with neighbouring stromata. Stroma sub-epidermal, the base being sharply defined against the sub-epidermal cell-layer; the sub-epidermal layer and the rest of the mesophyll remaining unchanged even when two stromata are formed opposite to each other, on each of the leaf surfaces; only the region adjoining the base of the stroma is coloured red. The stroma consists of vertical, parallel prosenchyma, in the epidermal clypeus the cells are short and opaque black. Loculi broadly ellipsoid, raising the epidermis in which the clypeus has developed; at the base only resting on a thin line of stroma which is against the sub-epidermal cells, 300–350 μ diam., 140–170 μ high. Asci cylindrical, paraphysate, eight-spored, 45–58 $\mu \times$ 7–10 μ . Spores monostichous, one-celled, hyaline, ellipsoid, rounded at both ends, 8–10 $\mu \times$ 4–5½ μ .

35. *Phaeochorella parinari* (P. Henn.) Th. et Syd.

Ann. Myc. XIII (1915), p. 405.

Syn. *Cocconia parinari* P. Henn., Engl. Bot. Jahrb. XXX, 1901, p. 257; Syll. Fung. XVIII, p. 159.

On leaves of *Parinarium capense*, Pretoria Dist., October, 1908, Doidge [613]; 10.4.11, Erasmus [1272]; 29.4.11, Doidge [1507]; 8.4.12, Doidge [2203]; Seven Oaks, Natal [10981].

On *Parinarium mobola*, Rhodesia, Howard [730]; Zoutpansberg Dist., 6.8.11, Doidge [1809]; Barberton, 16.8.11, V. d. Bijl [1922]; Zoutpansberg Dist., 19.10.14 [9173].

Stromata epiphyllous, more or less covering the leaf surface, round to irregular, 1½ to 4 mm. in diam., convex, somewhat shiny, black, with a rough surface, 400–450 μ high, with a flat base resting on the sub-epidermal layer of cells, which is not stromatized, covered with an epidermal clypeus, light brown, vertically prosenchymatous in structure. Loculi numerous, pear-shaped, 300–400 μ diam., with an indistinctly periphysate neck. Asci cylindrical, 85–100 $\mu \times$ 11–15 μ , with delicate, filiform, hyaline paraphyses. Spores up to eight in an ascus, mostly monostichous, elliptic to oblong, rounded at both ends, red-brown, one-celled, with a slender medial hyaline band, 12–17 $\mu \times$ 8–9 μ .

36. *Phragmocaula viventis* (Cke.) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 41.

Syn. *Dothidea viventis* Cke., Grevillea V, p. 16.

Phyllachora viventis (Cke.) Sacc., Syll. Fung. II, p. 601.

Dothidea viventis var. *albizziae* Cke., *ibid.*

Phyllachora albizziae Cke., Grevillea XIII, p. 65.

Homostegia albizziae (Cke.) Berl et Vogl., Syll. Fung. IX, p. 1049.

On leaves of *Albizzia fastigiata*, Inanda, Natal, May, 1881, Medley Wood (Wood No. 583) [9492] and [16445]; Winklespruit, Natal, 13.4.11 and 2.7.11, Pole Evans [1401] and [1583]; Stella Bush, Durban, 11.7.11, Doigde [1615]; Verulam, Natal, 3.7.13, Pole Evans [6829].

Stromata usually hypophyllous, small, irregular elliptic or oval in outline, somewhat raised, dull black, 0.5 to 0.7 mm. in length, the long axis often lying along a vein or in small groups of 2-4. Stroma arising between the peridermal and the sub-epidermal cells, with its base at the level of the epidermis. Loculi, several, under a common, arched, epidermal clypeus, spherical to lenticular, 190-200 μ diam. at maturity. Asci paraphysate, cylindrical, 80 $\mu \times$ 10-12 μ , with a foot 15-18 μ long. Spores distichous, colourless, four-celled, constricted at the middle, 20-24 $\mu \times$ 5-6 μ . The asci do not stain blue with iodine.

37. *Scolecodothis capensis* n. sp.

On leaves of *Olea* (?) *foveolata*, Howiesons Poort, Grahamstown, 17.1.17, Doidge [10963]; 12.7.19, Doigde [12379]; Van Stadens Pass, 13.11.17, Doidge [10869].

Stromata amphigenous; the epiphyllous stromata develop first, they are scattered, round to irregular, 1-1½ mm. diam., raised and convex above leaf surface, occasionally larger and irregular in shape by confluence, black and shining. Hypophyllous stromata smaller and flatter, and usually more or less undeveloped and sterile. The leaf tissue is not discoloured. Stroma between the epidermis and the palisade tissue. Clypeus epidermal, thick, opaque, 90-100 μ thick. The inner part of the stroma consisting of lighter brown, prosenchymatous plectenchyma. Loculi 4-5 in each stroma, immersed, lenticular or somewhat irregular by compression, 550-650 μ diam., 200-250 μ high. Asci paraphysate, eight-spored, narrow, ellipsoid, tapering to both ends, pedicellate, 100-120 $\mu \times$ 13-14 μ . Spores parallel, hyaline, one-celled, narrow, fusiform, pointed at both ends, 60-70 $\mu \times$ 5-6 μ in centre.

Scolecodothis capensis Doidge, nov. sp.

Stromata amphigena, sparsa, rotundata v. irregulares, 1-1½ mm. diam., convexa, atra, nitidula. Loculi 4-5 in quoque stromate, 550-560 μ diam., 200-250 μ alti; clypeo opaco, aterrimo, 90-100 μ crasso. Asci paraphysati, octosporo, anguste ellipsoidei, utrinque attenuati, pedicellati, 100-120 $\mu \times$ 13-14 μ . Sporae parallelae, hyalinae, continuatae, fusoidae, 60-70 $\mu \times$ 5-6 μ .

Hab. in foliis *Oleae* (?) *foveolatae*, Grahamstown, 17.1.17, leg. Doidge [10963].

38. *Phyllachora caffra* Syd.

Ann. Myc. XV (1917), p. 548.

Syn. *Physalospora caffra* Syd., Ann. Myc. X (1912), p. 39.

On leaves of *Cordia caffra*, Amanzimtoti, Natal, 10.7.11, Doidge [1631].

Stromata epiphyllous, minute, gregarious on irregular rusty-brown spots, 250-300 μ in diam., unilocular; on the upper leaf surface round, punctiform, convex, shining; on the lower surface the epidermis becomes somewhat convex, and later the stroma becomes visible as a minute, dull-black point. Loculi occupying the whole thickness of the leaf, spherical, 250-300 μ diam., with a short epidermal clypeus at the apex, the lateral and basal wall consisting of a web of hyaline or yellowish threads; where the basal wall is

near the lower epidermis, a short clypeus is formed. The leaf, which is normally 200–220 μ thick, becomes arched over the loculus to a thickness of 360 μ . Asci cylindrical, paraphysate, 75–90 $\mu \times$ 9–12 μ . Spores monostichous, ellipsoid, hyaline, broadly rounded, one-celled, 11–13 $\mu \times$ 6–8 μ .

39. *Phyllachora dombeyae* Syd.

Ann. Myc. XV (1917), p. 532.

Syn. *Physalospora dombeyae* Syd., Ann. Myc. X (1912), p. 441.

On *Dombeya rotundifolia*, Equeefa, Natal, 24.4.11, Fuller [1539].

On *Dombeya schimperiana*, Woodbush, Zoutpansberg Dist., 4.8.11, Doidge [1762].

Stromata epiphyllous, gregarious on yellow leaf spots, $\frac{1}{3}$ – $\frac{1}{2}$ mm. diam., convex, somewhat shiny, not visible on the lower leaf surface, or only visible as minute dull black spots; with one or few loculi. Loculi spherical, 160–190 μ diam., covered at the apex with a dark epidermal clypeus, almost without lateral walls, not touching the lower epidermis, or forming a very short clypeus in the lower epidermal cells. Asci clavate, paraphysate 60–75 $\mu \times$ 15–20 μ . Spores distichous or tristichous, one-celled, hyaline, rounded at both ends, asymmetrical, straight or slightly curved, 25–35 $\mu \times$ 3–4 $\frac{1}{2}$ μ . Conidia filiform, curved 18–26 $\mu \times$ 1–1 $\frac{1}{2}$ μ .

40. *Phyllachora melianthi* (Thuem.) Sacc.

Syll. Fung. IX, p. 1013; Ann. Myc. XIII (1915), p. 528.

Syn. *Rhytisma melianthi* Thuem., Flora, 1876, p. 569.

Cryptomyces melianthi (Thuem.), Sacc., Syll. Fung. VIII, p. 707.

On *Melianthus major*, near Capetown, January, 1884, MacOwan (Rabh. Wint. Fung. Eur. 3557) [3897].

On *Bersama lucens*, Kentani, 3.7.15, Pegler [9017].

Stromata on both sides of the leaves, numerous, scattered, small, unilocular, hemispherically or conically convex, flat at the periphery, $\frac{1}{2}$ mm. diam., black; on the opposite side of the leaf the grey epidermis bulges out, and later becomes filled with stroma and becomes black. Between the two leaf surfaces lies a single large stroma (1–1 $\frac{1}{2}$ mm. diam.), which either remains unilocular, surrounded only by a broad, flat, stromatic border, or contains several loculi, and is then not surrounded by sterile stroma. Clypeus epidermal opaque, 15–25 μ thick, inner part of stroma and locular wall consisting of light brown prosenchyma. Locular wall thin, delicate. Loculi flattened spherical, 240–280 μ diam. (in stromata on *Bersama*, 320–450 μ diam.), 240–300 μ high, occupy from three-quarters to the whole of the thickness of the leaf; occasionally irregular in shape where a vascular bundle impinges on locular wall, dehiscing towards the upper leaf surface by an apical pore. Asci paraphysate, cylindrical to clavate, 60–70 $\mu \times$ 15–18 μ . Spores mono- or distichous, ellipsoid, hyaline, one-celled, rounded at both ends, 13–14 $\mu \times$ 7–8 μ .

41. *Phyllachora hieronymi* P. Henn.

Pilze Ostaf. apud. A. Engler, Die Pflanzenwelt-Ostafrikas, p. 34; Syll. Fung. XIV, p. 673.

On *Cyathea dregei*, Winters Kloof, Natal, 27.6.11, Doidge [1666].

Stromata epiphyllous, shiny black, often on the veins, slightly convex, 0.4–0.5 mm. diam., usually unilocular, penetrating right through the leaf. Clypeus epidermal, well developed, opaque, 30–33 μ thick. Locular wall brown, thin, 12–14 μ thick, often thinner at the sides. Loculus flat ellipsoid, 300–320 μ diam., 170 μ high. Asci paraphysate, clavate-cylindrical, briefly pedicellate, 65–70 $\mu \times$ 16–20 μ . Spores distichous, hyaline, oblong, 20–24 $\mu \times$ 7–8 μ .

42. *Phyllachora aberiae* P. Henn.

Engl. Bot. Jahrb., XLI (1908), p. 272; Syll. Fung. XXII, p. 411.

On *Doryalis caffra*, Driefontein, Zoutpansberg Dist., 12.8.11, Doidge [1813]; Uitenhage, C.P., 31.5.12, Pienaar [2420]; 17.10.06 [224].

Stromata epiphyllous, cellular, $\frac{3}{4}$ –1 mm. broad, shiny, black, subrotund to irregular, slightly raised, showing on the under side of the leaf as minute raised points on the discoloured leaf tissue. Leaf normally 280 μ thick, hypertrophied in the region of the stroma, 400–500 μ thick. Clypeus epidermal epiphyllous, continuous, 25–34 μ thick. Loculi under the clypeus in the mesophyll, flask-shaped, or spherical with a wide neck, the base of the loculi being one-half or two-thirds of the distance through the thickness of the leaf; surrounded by a brown, thick wall, which is 25–38 μ thick and formed of loosely interwoven hyphae; usually opening towards upper leaf surface, occasionally towards the lower, when it is covered by a short hypophyllous epidermal clypeus: occasionally two loculi on opposite sides of the leaf come into contact at their bases and are consequently flattened. Loculi 240–270 μ diam., or 250–280 μ high with a breadth of 200–220 μ . Between the necks of neighbouring loculi a loose hyphal stroma spreads inwards from the clypeus.

Asci ellipsoid, with monostichous, transverse, or partly distichous spores; seldom cylindrical with distichous or imbricate monostichous spores, shortly pedicellate, foot usually 8–10 μ long, rarely 22–30 μ long; asci 80–90 μ long and 12–20 μ broad, according to the arrangement of the spores, eight-spored, paraphysate. Paraphyses numerous. Spores cylindrical, rounded at both ends, 26–33 $\mu \times 4\frac{1}{2}$ –5 μ , hyaline, one-celled.

43. *Phyllachora amaniensis* P. Henn.

Engl. Bot. Jahrb. XXXVIII, 1905, p. 113; Syll. Fung. XXII, p. 420; Ann. Myc. XIII (1915), p. 473.

On leaves of *Ficus capensis*, Amanzimtoti, Natal, 19.3.14, Franks [7812]; Barberton Dist., 16.10.13, V. d. Bijl [7378]; Wyebank, Natal, 29.8.15, Doidge [9537].

This fungus was originally described on leaves of *Ficus* sp. collected at Amani, Usambara; the South African specimens agree with the description in all important particulars, but the spores are slightly narrower, the spores of the type being 7–8 μ wide.

Stromata epiphyllous, scattered or loosely arranged in groups $\frac{1}{2}$ –2 cm. diam., round or irregular, slightly raised, 1–1.5 mm. diam., dull black, not visible on upper surface, or showing as minute black pin-spots. Stroma originating in the lower part of the mesophyll, dividing the leaf into two very unequal portions, the lower narrower portion being pushed up by the developing stroma and forming an arch over it. Clypeus epidermal opaque, 25–35 μ thick. Loculi sub-spherical, less frequently flask-shaped, the narrowing in the latter case being due to crowding, deeply sunken in the leaf tissue, and occupying three-quarters or even more of the mesophyll. The base of the loculi usually rests on the palisade cells and the latter become filled with black, opaque stromatic tissue, which may or may not involve the upper epidermis. Loculi 240–400 μ diam., lateral walls delicate, 10–15 μ thick, consisting of light brown, rather thin-walled prosenchyma. Asci cylindrical with numerous paraphyses, 90–130 $\mu \times 9$ –11 μ , straight or curved, eight-spored. Spores monostichous, ellipsoid, rounded at both ends, hyaline, continuous, 14–17 $\mu \times 6$ –7 μ .

44. *Phyllachora Peltophori* Syd.

Ann. Myc. X (1912), p. 40; XIII (1915), p. 507.

On *Peltophorum africanum*, Ledzee, Zoutpansberg, 7.8.11, Doidge [1810].

Stromata on both surfaces of the pinnules, scattered or in groups, minute, about $\frac{1}{3}$ mm. diam., slightly convex, unilocular, smooth, shining. Loculi flattened, spherical, 200–250 μ diam., 160–180 μ high, covered above and below by the epidermal clypeus, which only extends a short distance beyond the loculi. Lateral locular wall weak or wanting. Asci clavate, paraphysate, 65–80 $\mu \times 14$ –18 μ . Spores distichous, ellipsoid, hyaline, rounded, 13–17 $\mu \times 6$ –8 μ .

45. *Phyllachora Lessertiae* n. sp.

On leaves of *Lessertia tenuifolia*, Smits Kraal, Boshof Dist., June, 1911, Burt-Davy [1568].

Stromata amphigenous and petiolar, but mostly epiphyllous, scattered or crowded, minute, up to 0.5 mm. diam., somewhat raised, dull black, mostly unilocular. Stroma reduced to a clypeus above each loculus, 100–120 μ broad, and certain hyphal strands and knots under the clypeus and extending beyond it in the sub-epidermal cells. Loculi sub-spherical to pyriform, 169–190 μ diam., 200–240 μ high, occupying about one-third of thickness of leaf. Locular wall about 15 μ thick, consisting of delicate, compressed, colourless hyphae, broader near apex and darker coloured, fusing above with clypeus. Asci eight-spored, paraphysate, cylindrical or narrow-ellipsoid, with a very short foot, 80–90 $\mu \times 12$ –16.5 μ . Periphyses present. Spores one-celled, hyaline, ellipsoid, rather thick-walled, obliquely monostichous or sub-distichous, 15–17 $\mu \times 8.5$ –10 μ .

Phyllachora Lessertiae Doidge, nov. sp.

Stromata plerumque epiphylla, sparsa, minuta, usque .5 mm. diam., vix vel leniter convexa, atra, clypeo epidermale, 100–120 μ lato, unilocularia. Loculi subglobosi v. pyriformi, 160–190 μ diam., 200–240 μ alti, parietibus circ. 15 μ crassis. Asci octospori, paraphysati, cylindracei, v. ellipsoidei, brevissime pedicellati, 80–90 $\mu \times 12$ –16.5 μ . Sporae continuae, hyalinae, ellipsoideae, utrinque rotundatae, 15–17 $\mu \times 8.5$ –10 μ .

46. *Phyllachorella rikatliensis* n. sp.

On leaves of *Andradia arborea*, Rikatli, P.E.A., September, 1918, Junod [11736].

Stromata minute, punctiform, about 0.3–0.5 mm. diam., amphigenous, penetrating right through the leaf, scattered over greater part of leaf surface or in round irregular patches about 5 mm. diam., black shining, slightly convex. Epidermal clypeus on both sides of leaf, black, opaque, about 20 μ thick, only extending a small distance on each side of the loculi. Inner part of stroma of usual prosenchymatous structure; in this the loculi are embedded. Stroma may contain a single flattened spherical loculus, 240–250 μ diam., 140–150 μ high, or a single pycnidium of similar dimensions. Very frequently the flattened spherical loculus is about 300 μ diam. and has a small lenticular pycnidium cut off from one surface; exceptionally, there are two smaller loculi and a pycnidium, the shape of each being an irregular cone on a curved base. Locular wall about 10 μ thick.

Asci aparaphysate, clavate, eight-spored, 50–60 $\mu \times 13$ –15 μ . Spores usually distichous, crowded in upper half of ascus, hyaline, one-celled, oblong, rounded at both ends, 10–13.5 $\mu \times 3.5$ –5 μ .

Conidia brown, oblong, continuous, 13.5–15 $\mu \times 6$ –7 μ .

Phyllachorella rikatliensis Doidge, nov. sp.

Stromata amphigena, minuta, circ. 0.3–0.5 mm. diam., atra, nitidula, leniter convexa. Loculi 1–3 in quoque stromate, sub-globosi v. compressi, 240–300 μ diam., 140–150 μ alti, clypeo atro, opaco, 20 μ crasso, parietibus 10 μ crassis. Asci aparaphysati, clavati, octospori, 50–60 $\mu \times 13$ –15 μ . Sporae plerumque distichae, hyalinae, continuae, oblongae, utrinque rotundatae, 10–13.5 $\mu \times 3.5$ –5 μ . Pycnidia loculis ascogenis similes, conidiis brunneis, oblongis, continuis 13.5–15 $\mu \times 6$ –7 μ .

Hab. in foliis *Andradiae arboreae*, Rikatli, P.E.A., 1918, leg. Junod [11726].

47. *Endodothella natalensis* n. sp.

On leaves of *Dalbergia armata*, Winklespruit, Natal, 6.7.12, Doidge [2513]; Verulam, Natal, 3.7.13, Pole Evans [6809].

Stromata epiphyllous, minute, punctiform about 0.3 mm. diam. or becoming larger by confluence, somewhat convex, black shiny, showing on the under-surface only as minute, brown blisters, uni- or bilocular. Clypeus epidermal, dark brown, sub-opaque, ca. 15 μ thick, spreading to a diameter of about 500 μ . Loculi sub-spherical to lenticular, 240–320 μ

diam. and 190–240 μ high, the base of the loculi being 30–45 μ from the lower surface of a leaf which is normally about 130 μ thick. Locular wall opaque, black, 13–16 μ thick, or somewhat lighter in colour and evidently prosenchymatous in structure. Loculi dehiscing by a apical pore opening towards upper side of leaf. In the bilocular stromata the space between the apices of the loculi is entirely filled with opaque, black, stromatal tissue. Asci paraphysate, eight-spored, ellipsoid or narrow cylindrical, straight or curved, 80–87 $\mu \times 15$ –17 μ , with a short foot 6–7 μ long. Spores distichous or obliquely monostichous, hyaline, two-celled, not constricted, fusiform, 20–23.5 $\mu \times 8.5$ –10 μ , wall about 1.5–2 μ thick, cells sub-equal, or upper cell 10 μ long, lower cell 13.5 μ long.

Endodothella natalensis Doidge, nov. sp.

Stromata epiphylla, minuta, rotundata, cir. 3 mm. diam. v. confluendi majores, leniter convexa, atra, nitidula. Loculi 1–2 in quoque stromati, sub-globosi v. globosi-depressi, 240–320 μ diam., 190–240 μ alti, totam fere folii crassitudinem occupantes, clypea, atrobrunneo, subopaco, ca. 15 μ crasso, 500 μ lato, parietibus opacis, atris, 13–16 μ crassis. Asci paraphysati, octospori, ellipsoidei v. cylindracei, recti v. curvati, 80–87 $\mu \times 15$ –17 μ , pede breve 6–7 μ long. Sporae distichae v. oblique monostichae, hyaline, 1-septatae, haud constrictae, fusiformae, 20–23.5 $\mu \times 8.5$ –10 μ , cellulis subaequalibus, v. supero 10 μ longo, infero 13.5 μ longo.

Hab. in foliis *Dalbergiae armatae*, Winklespruit, Natal, 6.7.12, leg. Doidge [2513].

48. *Endodothella strelitziae* (Cke.) Theiss. et Syd.

Ann. Myc. XIII (1915), p. 587.

Syn. *Dothidea strelitziae* Cke., *Grevillea* X., p. 120.

Phyllachora strelitziae Sacc., Syll. Fung. II., p. 606.

On leaves of *Strelitzia augusta*, Inanda, Natal, May, 1881, Medley Wood (Wood No. 580) [9468] and [10442]; Isipingo, Natal, 13.5.13, Doidge [6639]; Scottsburgh, Natal, 5.7.13, Pole Evans [6831]; Inanda, Natal, 13.9.13, V. d. Bijl [6958]; Kentani, 8.1.16, Pegler (Pegler No. 2384) [9422].

Stromata round, conical to hemispherical, 0.7–0.85 mm. diam., in groups of two to three, dull black, epiphyllous, unilocular, surrounded by a red brown zone in the leaf tissue; on the under side of the leaf only a wine-red discoloration is visible. The stroma fills the epidermis and the two sub-epidermal layers of elongated, flat cells, and raises these up to form an opaque clypeus, tearing them away from the adjacent layers of parenchyma. In the cavity thus formed the loculi are produced; they are covered by a clypeus formed from three layers of cells and about 100 μ thick; they are 650 μ diam. and 180 μ high; being separated at the base from the leaf parenchyma by a thin brown stromatic layer, the hyphae penetrating with the parenchyma in a more or less compact mass. Asci clavate, briefly pedicellate, paraphysate, 55–75 $\mu \times 13$ –16 μ , eight-spored. Spores distichous, oblong or clavate, hyaline, septate somewhat above the middle, not or slightly constricted, 14–17 $\mu \times 3$ –4 μ , upper cell shorter but broader, rounded, lower cell tapering somewhat.

49. *Oligostroma maculiformis* (Wint.) Doidge.

Syn. *Didymella maculiformis* Wint., Rab. Wint. Fung. Eur. 3056 (1884).

Oligostroma proteae Syd., Ann. Myc. XII (1914), p. 265; XIII (1915), p. 592.

On *Protea grandiflora*, near Capetown, June, 1884, MacOwan (Rab. Wint. Fung. Eur. 3056) [3396].

On *Protea flanaganii*, Kentani, 17.7.12, Pegler, 5163. (This is the type collection of *Oligostroma proteae* Syd.)

On *Protea neriifolia*, Bains Kloof, near Wellington, 19.11.10, Doidge [1026]; 5.4.12, Stoneman [2231].

On *Protea* spp., Wellington, 10.6.11, Mally [1589]; without locality [943].

(?) Stroma not fully developed on *Protea* sp., Kentani, 19.10.12, Pegler [5618], and on *Protea abyssinica*, Diepkloof, near Dullstroom, 19.9.10, Doidge [931].

This fungus is very variable in its external appearance, but after careful comparison I think there can be no doubt that *Oligostroma protea* Syd. on *Protea flanaganii* [5163] is identical with Winter's *Didymella maculiformis*. The variations mentioned in macroscopic characters are due to variations in the thickness of the cuticle of the host, rather than to any variations in the structure of the fungus.

Stromata amphigenous, forming discoloured, roughened areas on both sides of the leaf; these are usually irregular in outline and up to 10 mm. in diam. or larger by confluence; less frequently they are more or less circular and develop centrifugally. The stroma is reduced to an epidermal clypeus, 150–250 μ diam. over each loculus and the short scattered hyphal strands or knots under it. Sometimes the loculi are closely crowded and the clypeus over adjoining loculi becomes confluent, forming a more or less continuous stromal plate, or the loculi may be more scattered, solitary, or in twos and threes.

Loculi immersed, globose or ovate globose, 100–150 μ diam., locular wall consisting of small brown cells and fused at the apex with the epidermal clypeus. Asci sessile, cylindrical-clavate or clavate, 75–100 $\mu \times$ 16–20 μ , rounded at the apex, paraphysate, eight-spored. Spores distichous, oblong-cuneate, unequally uniseptate, not constricted, 24–28 μ long; upper loculus shorter, but more broadly rounded or ovate 8–10 μ long, 7–9 μ broad, lower loculus longer and narrower, 15–19 $\mu \times$ 6–8 μ , hyaline or sub-hyaline.

50. *Ophiodothella edax* (B. and Br.) V. Höhn.

Fragm. XII No. 630 (1910).

Syn. *Dothidea edax* B. et Br., Journ. Linn. Soc., 1873, p. 135.

Ophiodothis edax Sacc., Syll. Fung. II, p. 653.

On leaves of *Tephrosia elongata*, Olifantsfontein, Pretoria Dist., 21.2.20, Pienaar [12822].

This fungus was originally described on leaves of *Tephrosia suberosa* from Ceylon. The South African specimen agrees with the description of the original, except in the size of spores. These are said to average 33–35 $\mu \times$ 2.8–3.2 μ , but it is also stated that the asci are not quite ripe. It is probable, therefore, that the difference in the measurements of the spores is due to the fact that the present specimen is in a more mature condition.

Stromata minute, black, punctiform, formed in groups on large yellow leaf spots. There is an epidermal clypeus on both upper and under surfaces of the leaf, which is black, opaque, about 20 μ thick in the lower epidermis, 25–30 μ in the upper. There are 1–3 loculi in each stroma; these are flattened-spherical, 200–250 μ diam., 150–200 μ high, at base and apex united with the clypeus. The locular wall is 8–10 μ thick and consists of hyaline very much flattened cells. Asci numerous, paraphysate, eight-spored, thin-walled, pedicellate, clavate-ellipsoid, 70–80 $\mu \times$ 10–13 μ . Spores parallel, filiform, continuous, hyaline, straight or curved, thin-walled, cylindrical, somewhat attenuated towards the blunt ends, 45–60 $\mu \times$ 3–3.3 μ .

THE GENUS BERSAMA.

By E. P. PHILLIPS, M.A., D.Sc., F.L.S., Botanist in Charge of the
National Herbarium.

THE genus *Bersama* was monographed by Mr. E. G. Baker in 1907 (Journ. Bot., XLV, p. 12), and two species, viz., *B. lucens*, Szyszl., and *B. tysoniana*, Oliv., were described from South Africa. From information received from the Union Forest Department, it was suspected that other species occurred in the South African forests, and, at the suggestion of the Chief of the Division of Botany, I undertook the examination of all the material in the local herbaria. This has led me to separate two plants as distinct species from specimens hitherto always called *B. tysoniana*.

The interest in the various species was first aroused by Mr. C. C. Robertson, M.F., the Senior Research Forest Officer, who sent samples of the bark of *B. tysoniana* to the Imperial Institute for examination, as it was reported that the natives used the bark medicinally. The information supplied by Mr. Robertson to the Imperial Institute did not tally in some respects with the actual samples forwarded, and he took a good deal of trouble to clear up the matter. We are now in a position to state that the information Mr. Robertson received applied to a distinct species which I have named *B. Swinnyi*, while the bark supplied was that of *B. tysoniana*. Dr. T. R. Sim,* in his description of *B. tysoniana*, falls into the same error, as the tree referred to by Mr. Henkel as having "a very bitter bark, like quinine in taste," is not this species, but quite a distinct plant, which I have named *B. Stayneri*, so his remarks on *B. tysoniana* do not refer to this species alone. Sim suspected the Port St. Johns' plants to be an allied but distinct species, and I have been able to confirm this. It is the plant now named *B. Swinnyi*.

Mr. J. J. Kotze, B.Sc., of the Forest Department, who has given me every assistance in this work, allowed me to go through the files relating to the genus, and, having the actual specimens in the Forestry Herbarium, I was able to clear up some doubtful points. All the correspondence referred to plants which went under the name of *B. tysoniana* and the information was confusing until I was able to definitely recognize that three distinct species were involved. The information derived from the above source I have tabulated under the specific names.

B. tysoniana.

The Conservator of Forests, Transkeian Conservancy, states: "Trees are scattered singly, fairly plentifully over most of the mountain forests and where accessible. It is a prolific seeder, and I am of opinion that it could be easily propagated artificially under mountain forest conditions in its habitat. In collecting the bark, natives do not cut down the whole tree, but merely take their requirements from time to time from living trees. I can confirm the statement: it is a well-known fact that local natives use the bark medicinally." (Stated that native doctors use the bark as a specific against fevers.—(E. P. P.)

* Sim, "Forest Flora, Cape Colony," p. 175.

A sample of bark was collected by Forester Van de Vijver from the Ngadu Patrol, and he writes: "This bark is used as medicine by some natives, but not all. In cases of calves being thin, they dose the animal with it powdered and mixed with other roots, also lambs." Forester Dawson submitted a sample of bark from the Amanzamnyama Patrol, with the note: "Bark has a slightly bitter taste. I have only seen one tree in my patrol and very few natives know it here. They do not seem to use it themselves, but on their cattle for gall-sickness after boiling bark and dosing from one to two bottles." Forester Fegen collected samples of bark from the Notinsela Patrol, and reported: "Bark has a slightly bitter taste. Natives state that the bark is used as a medicine for hysteria, which is common amongst the native girls. Other natives state that it is used indiscriminately for both cattle and human beings. Judging by the number of trees barked, it must be used more extensively for medicine than natives will admit."

Forester Kriel, who collected the species in the Wilo Forest, Mqanduli District, reports it to be a tree about 25 ft. high with a girth of 42 in.

The tree is locally known as "Bitter Bark" and "Bastard Sneezewood" and by the natives as "Endiaza" or "Andianda."

B. Swinnyi.

Forester Swinny reports this species to be a tree up to 90 ft. high, with a stem diameter of 2-3 ft., and not common at Port St. Johns. He further states that there appears to be two forms of the species which the natives distinguish, though they have only one name, "Sendiandia." The smaller form, when full grown, has a trunk 1-1½ ft. in diameter.

Mr. Robertson first detected the difference in the barks of this species and *B. tysoniana*, and noted that the bark had "a strong bitter taste producing a sort of burning sensation in the mouth lasting for several hours, during which I could taste nothing else distinctly." He forwarded a sample of the bark to the Imperial Institute in March, 1915. Mr. Ross, then Conservator in the Eastern Conservancy, writes: * "I distinctly remember this tree being pointed out to me many years ago when stationed at Kokstad as being of value medicinally, an infusion of the bark being extensively used by the natives for certain ailments. It is found somewhat sparingly throughout the mid-Pondoland forests and close to the Natal border in the Mount Ayliff District. It is a very conspicuous object in the forests, of large girth, with deeply furrowed bark, and with foliage not unlike sneezewood. It is usually unsound near the base and shows signs of much damage by removal of bark. This tree is by some foresters confused with 'Coffee Pear' (*Pleurostyliia capensis*), but a keen observer will easily distinguish a great difference."

Forester Pretorius collected samples of bark from the Cwebe Patrol and supplied the following information:—"Bark has a slightly bitter taste (Mr. Robertson remarks 'but burning taste'). The bark of this tree in these parts is very thin and can only be removed in small bits. The natives use it for different medicines, but they refuse to say what it is really used for." Specimens of bark from the Port St. Johns Patrol were received with similar information to the above; in each case Mr. Robertson noted the burning taste, more so in some specimens than in others.

B. Stayneri.

This species was sent to Mr. Robertson by Forester C. W. Chilvers in June, 1915. Mr. Robertson noted the differences between these specimens and *B. tysoniana* as follows:—

1. Bark has not got the "strong bitter taste" which I referred to in the case of one of the specimens from the Transkei (i.e. *B. Swynni* E.P.P.).
2. Under sides of the leaves and the petioles are very hairy, whereas they are glabrous on specimens received from the Transkei.
3. The specimens were in flower when collected in May. Sim states that this species † flowers in August to September.

* It is just possible that some of Mr. Ross's remarks may apply to *B. tysoniana*.

† Mr. Robertson, although he noted these differences, still considered the plant *B. tysoniana*.

Mr. C. F. Stayner, in a minute to the Conservator of Forests, Pietermaritzburg, states : "One large tree isolated by heavy fellings was in flower as late as September, and I have come to the conclusion that this species (but he confused his specimen with *B. tysoniana* E.P.P.) is inconsistent in its period of blossoming. I find that *Bersama* is well known to native herbalists and is frequently employed, but for what disease it is a specific I cannot ascertain." Mr. Stayner submitted his specimen to the Bolus Herbarium, and these were reported on as follows:—"Very nearly allied to *B. tysoniana*, Oliv., and probably that species, but the type of *B. tysoniana* has more slender, longer, and less tomentose petioles."

Mr. J. S. Henkel, who also collected the species at Mkazeni Forest Reserve, Riverside, Natal, in March, 1917, states "that the tree is about 30 ft. high—a bole about 70 in. in girth and 12 ft. long, somewhat crooked. Natives use the bark as medicine and the tree has been injured by the removal of bark. Bark has a bitter quinine-like taste." Mr. Henkel also noted that the leaves were hairy, and not glabrous. Forester Honshold informs Mr. Henkel that in the reserve there are about three to four other trees, all smaller than the one he saw. In the bush many seedlings were noticed up to about 4 ft. high. The young shoots are frequently reddish in colour and leaves serrated and mucronulate, but older leaves have margins entire.

Mr. Robertson took considerable pains to sift all the evidence he had accumulated, and tabulated his results* as follows:—

Mr. Robertson distinguished the various samples of bark he examined as (1) those with a bitter taste and (2) those with a bitter and burning taste. This latter property he referred to as "X."

Forest.	Large or Small Variety.	Sample of Bark.	Taste.	Remarks.
MOUNTAIN FORESTS.				
Kambi.....	Presumably the large variety	Sent June, 1914, and February, 1915	Not X.....	<i>B. tysoniana</i> , sent to Imperial Institute.
Nqadu.....	Large.....	Collected March, 1915..	Not X.....	<i>B. tysoniana</i> .†
Amanzamnyama.	Large.....	Collected March, 1915..	Not X.....	<i>B. tysoniana</i> .
COAST FORESTS.				
Port St. Johns..	Large.....	Sent July, 1914.....	Has X.....	<i>B. Swinnyi</i> .
Bulolo Forest...	Large.....	Collected March, 1915..	Has X, though not strongly	<i>B. Swinnyi</i> .
Mboleni Forest..	Large.....	Collected March, 1915..	Not X.....	<i>B. tysoniana</i> .
Cwebe Forest...	Large.....	Collected March, 1915..	Has X, though not strongly	<i>B. Swinnyi</i> .
Cwebe Forest...	Small.....	Collected March, 1915..	Has X, though not strongly	<i>B. Swinnyi</i> .
Port St. Johns..	Small.....	Sent July, 1914.....	Has X.....	<i>B. Swinnyi</i> .
Bulolo Forest...	Small.....	Collected March, 1915..	Has X.....	<i>B. Swinnyi</i> .†

Mr. Robertson came to the following conclusions:—

1. In mountain forests the large variety (i.e. *B. tysoniana* E.P.P.) has not "X." Yet the natives do use the bark in these forests, so that its medicinal qualities do not depend on its having "X." It appears that only the large variety is found in the mountain forests.

* In the "Remarks" column I have inserted the name of the species which was given in the original by a herbarium number only.

† I have not seen specimens of these, but do not doubt the correctness of the names given.—(E. P. P.)

2. In the coast forests the large variety * usually has "X" to a greater or less extent, but apparently not so strongly as the small variety (*B. Swinnyi* *E.P.P.*). The latter always has it and usually very strong.

The results of my investigation may be summarized as follows:—

1. Foresters had hitherto only recognized two species, viz., *B. lucens* and *B. tysoniana*.
2. Under the name of *B. tysoniana*, three species have been included—
 - (a) *B. tysoniana*, found in both the mountain and coast forests.
 - (b) *B. Swinnyi*, found only in the coast forests.
 - (c) *B. Stayneri*, only recorded from Natal.
3. The bark of *B. tysoniana*, *B. Swinnyi*, and *B. Stayneri* is used medicinally by the natives.
4. The bark of *B. Swinnyi* has a bitter *burning* taste and differs in this respect from that of *B. tysoniana* and *B. Stayneri*, in which the bark, while bitter, has not the burning taste.
5. There appear to be two forms of *B. Swinnyi* in the forest of Port St. Johns, known to the foresters as the large and small varieties. The natives are said also to distinguish these, but have the same name for both.

I have been unable to furnish any additional information with regard to the other species recorded.

In conclusion I should like to refer again to Mr. C. C. Robertson's share of this work. Since 1914 he has been slowly accumulating evidence from foresters about the species, and my remarks are only a digest of the information he collected.

With the assistance of the Forest Department, the Division of Botany is undertaking an examination of the barks of the various species as regards their medicinal value.

KEY TO SPECIES.

- Inflorescence quite sessile, ovoid or globose, surrounded at the base by numerous large ovate acuminate silky bracts..... *Swinnyi*.
 Inflorescence distinctly peduncled, rarely sub-sessile, but then bracts at the base never densely silky.
 Mid-rib on lower surface of leaflets covered with long straight hairs. *Stayneri*.
 Mid-rib on lower surface of leaflets glabrous.
 Fruits without woody protuberances; inflorescence silky or tomentose with fine adpressed hairs.
 Leaves usually 2-3-jugate; leaflets obovate, usually rounded at the apex, obtuse..... *lucens*.
 Leaves usually 4-jugate; leaflet oblong-lanceolate, acuminate, acute..... *abyssinica*.
 Fruits with woody protuberances; inflorescence tomentose with spreading hairs appearing almost shaggy..... *tysoniana*.

1. *B. Swinnyi*, Phillips.

Arbor. *Rami* glabri vel juniores serici. *Folia* 10-20 cm. longa, pinnata, 5-jugata; foliola 2-8 cm. longa, 0.9-3.5 cm. lata, oblongo-lanceolata, ovato-oblonga vel ovata, apice obtusa, glabra. *Racemus* sessilis, 2.5-5 cm. longus, circa 3 cm. latus, subglobose vel ovatus. *Bracteae* numerosae, 2 cm. longae, ovatae, acuminatae, sericae.

A large or small tree, with rough bark. *Branches* glabrous or in very young branches velvety. *Leaves* 10-20 cm. long, grouped at the ends of the branches, petiolate, pinnately compound, 5-jugate; petiole 2.5-3.5 cm. long, pubescent in young leaves, glabrous in older leaves; leaflets petiolulate, 2-8 cm. long, 0.9-3.5 cm. broad, oblong-lanceolate or ovate-oblong, or ovate, obtuse or slightly retuse at the apex, rounded at the base, with

* Mr. Robertson here confuses *B. tysoniana* and *B. Swinnyi*, both of which occur in the coast forests.—(*E. P. P.*)

the mid-rib prominent beneath and the lateral veins distinct, glabrous. *Inflorescence* sessile, 2.5–5 cm. long, about 3 cm. in diameter, subglobose or ovoid in shape, surrounded at the base with numerous ovate acuminate densely silky bracts about 2 cm. long. *Floral-bract* 7 mm. long, ovate, acuminate, very densely silky. *Pedicel* about 4 cm. long, terete, silky. *Sepals* 6 mm. long, ovate, acute, distinctly keeled, silky. *Petals* 1.3 cm. long, about 3 mm. broad at the middle, spatulate-linear, tomentose without, sometimes with two marginal processes at the middle. *Stamens* monadelphous; filaments terete and narrowing above, flattened below and hairy on the flattened portion. *Ovary* 1.5 mm. long, sub-globose, villous; style 1.3 cm. long, terete and densely villous in the lower $\frac{3}{4}$ becoming more or less four-angled and glabrous above; stigma globose. *Fruit* not seen.

Pondoland: In monte propoxe ostium flum St. Johns R., c. 1000 ft., February, *Bolus* 8724; 20 ft., January, *Flanagan* 2884; Port St. Johns, *Swinny in Herb. Forest Dept.*, 1038, 1037; Pongwani Forest, Port St. Johns, January, *Coetzee in Herb. Forest Dept.*, 1866.

2. *B. Stayneri* Phillips.

Rami glabri. *Folia* pinnata, 7–16 cm. longa, 4–5-jugata; petiolus pilosus; folioal 1.7–5.2 cm. longa, 0.8–1.5 cm. lata, oblongo-lanceolata vel elliptica, apice acuta mucronataque, basi paullo cuneata, subtus pilosa vel pubescentia. *Racemus* 3.5–6.5 cm. longus. *Fructus* 2.7–3 cm. longus, ligneus.

Bark thick and rough. *Branches* glabrous, rough with longitudinal furrows. *Leaves* pinnate, petioled, 7–16 cm. long, 4–5-jugate; petiole 1–2 cm. long, very densely pilose; rachis densely pilose; leaflets 1.7–5.2 cm. long, 0.8–1.5 cm. broad, oblong-lanceolate or elliptic, acute and mucronate at the apex rarely rounded, slightly cuneate at the base, the mid-rib deeply sunk on the under surface which is frequently somewhat rugose, prominent beneath and with the lateral veins distinct beneath, glabrous above, pilose or pubescent beneath, especially on the mid-rib. *Inflorescence* a shortly peduncled many-flowered raceme, 3.5–6.5 cm. long; peduncle 1–1.5 cm. long, very densely pilose. *Bracts* 3 mm. long, linear, tomentose, *Pedicels* 5 mm. long, terete, tomentose. *Calyx* 6 mm. long, densely tomentose, divided almost to the base. *Petals* 1.3 cm. long, 3 mm. broad, spatulate-linear, tomentose, reflexed in open flowers. *Filaments* 5 mm. long, semiterete, monadelphous and villous at the base. *Ovary* densely villous; style 3 mm. long, terete; stigma subglobose. *Fruit* 2.7–3 cm. long dehiscing by four valves; valves woody, covered with woody protuberances. *Seeds* reddish in colour, 1.1 cm. long, 6 mm. in diameter, ellipsoid, with a waxy yellow arillus at the base.

Natal, without locality, *Stayner in Herb. Bolus*; Stinkwood Forest, Ingeli, May, *Chilvers in Herb. Forest Dept.*, 1518; Mkanzeni, Riversides, *Henkel in Herb. Forest Dept.*, 2421.

3. *B. lucens* Szysz.

A shrub 8–10 ft. high (ex *Wood*). *Branches* glabrous, with wrinkled greyish bark. *Leaves* petioled, compound, imparipinnate, 2–4-jugate, 10–20 cm. long; petiole 1.5–5.5 cm. long, glabrous, rarely pubescent; leaflets 1.8–9 cm. long, 1.3–4.6 cm. broad, obovate or obovate-elliptic, rarely elliptic, very rarely subacute, slightly narrowed at the base, glabrous, with the mid-rib distinct above, prominent beneath, and with thickened wavy margins. *Inflorescence* a lax axillary or terminal raceme, 6–14.5 cm. long, many-flowered; peduncle pubescent. *Pedicels* 0.4–1 cm. long, terete, densely tomentose with fine adpressed hairs; bracts 0.5 mm. long, ovate, pubescent. *Calyx* gamosepalous; lobes 3–4 mm. long, 2 mm. broad, ovate or ovate-elliptic, obtuse, finely but densely pubescent without and with fine adpressed hairs within, ciliated, the two posterior lobes connate and bifid at the apex. *Petals* dull yellow, 8.5 mm. long, 2.5 mm. broad above, oblong, obtuse, narrowed into an evident claw, pubescent. *Disc* unilateral. *Filaments* all connate at the base, 1 mm. long, terete, glabrous except at the base, the anterior filaments ciliated at the base and forming a tomentose shield 3 mm. long and 2.5 mm. broad; the posterior filaments

ciliated and pubescent at the base; anthers 2.5 mm. long, 1.5 mm. broad, oblong. *Ovary* 1 mm. long, 1.5 mm. broad, subglobose, densely villous, four-locular with a single ovule in each loculus; style 7 mm. long, cylindric, pubescent on the lower half; stigma globose, faintly lobed. *Fruit* 1.7 cm. long, 1.7 cm. in diameter, finely but densely pubescent, four-celled, each cell with a single seed, splitting into four valves when ripe. *Seeds* bright scarlet, 7 mm. long, 7 mm. in diameter, subglobose, wrinkled, flat on one side, convex on the other, with a fleshy yellow-green arillus. *Wood*, *Natal Plants*, 88; *Sim*, *Forests and Forest Flora*, 155; *Journ. Bot.*, XLV, p. 13. *Natalia lucens*, *Hochst.*, *Harv. and Sond.*, *Fl. Cap.*, 1, 369.

Komgha Div., Kei Mouth, 200 ft., August, *Flanagan*, 421; Transkei, Kentani, 20 ft., December, *Miss Pegler*, 726; Pondoland, mouth of St. Johns River, *February*, *Bolus*, 8836; *Flanagan*, 2568; 20 ft., January, Manino Forest, Engcobo Dist., August (leaf only). *Zahn in Herb.*, *Forest Dept.*, 2046; *Natal*, near Durban, 200 ft., February, *Wood*, 7392; March, *Wood*, 7518; Verulam, 100–200 ft., January, *Wood*, 10207; near Durban, *Wood*, 2570; 12666; Port Natal, *Gueinzuis*; Groenberg, February, *Wood*, 808; without precise locality, *Saunders*; near, Durban, 200–300 ft., March, *Wood*, 6307; Swaziland, kloof near Dalriach Mbabane, c. 4800 ft., December, *Bolus*; *Transvaal*, Barberton Dist., Unevoti Creek, Barberton, 3000 ft., February, *Galpin*, 849; *Thornicroft in Herb. Transvaal Mus.*, 18292.

Flanagan, 421, mentioned by Baker as a form with smaller leaflets than the type is slightly confusing, inasmuch as Flanagan gave the same number to two different collectings. His No. 421 in the Bolus Herb. was collected at the Kei Mouth at an altitude of 200 ft. in August, 1894, and is the true *B. lucens*. His No. 421 in the Cape Government Herb. was also collected near the Kei Mouth at an altitude of 300 ft., but in January, 1890. The inflorescence in these specimens is compact, oblong in outline, and at the end of a long naked peduncle 9–12 cm. long. The peduncle is fasciated to a slight extent, which will account for the compact inflorescence. There is no difference in the floral structures of these specimens and other specimens of *B. lucens* which I have examined.

4. *B. abyssinica* Fresen.

A tree. *Leaves* petioled, 18–22 cm. long, pinnate; petiole 4–5 cm. long, terete, glabrous; rachis sometimes winged between the uppermost pair of leaflets; leaflets usually in four pairs, 2.5–4 cm. apart, 4–9 cm. long, 1.7–3.5 cm. broad, oblong-lanceolate or ovate-lanceolate, acuminate, acute, entire, or the margin sometimes serrated in the upper half, glabrous. *Inflorescence* racemose, 10–20 cm. long, on a woody peduncle 5–7 cm. long. *Calyx* campanulate, silky. *Petals* five, ligulate-spathulate, twice as long as the calyx, densely and finely silky, finally reflexed. *Stamens* five, in the male flower nearly as long as the petals; filaments monadelphous, silky. *Capsule* about 1 cm. long, 1 cm. in diameter, subglobose 3–4 valved, densely pubescent, without woody protuberances. *Seeds* 6 mm. long, black.

This description was drawn up partly from a fruiting specimen collected by Schimper in Abyssinia and partly from the description in the “*Flora Tropical Africa*.”

Baker, in his monograph on the genus (*Journ. Bot.*, XLV, 12), makes no mention of this species occurring in Natal, though the record is made in the “*Flora Tropical Africa*,” I, 434.

= *B. integrifolia*, Richard, *Fl. Abyss.*, I, 107. This is a tropical African species.

5. *B. tysoniana* Oliv.

A tree 25 ft. high, with a girth of 42 in. (Krid). *Branches* glabrous. *Leaves* petioled, pinnately compound, 4–5-jugate, rarely 3-jugate, 5–20 cm. long; petiole 2–5 cm. long, subtomentose, pubescent to almost glabrous, sometimes white silky; leaflets 1.5–6 cm. long, 0.7–3 cm. broad, oblanceolate, oblong, oblong-elliptic, rarely obovate, rounded or shortly apiculate at the apex, cuneate more rarely rounded at the base, entire, rarely serrated in the upper half, with the mid-rib prominent beneath, glabrous. *Inflorescence* a

dense raceme, distinctly peduncled or subsessile, 6-17 cm. long, cylindric. *Peduncle* usually 1-3.5 cm. long, tomentose with spreading hairs. *Pedicels* 3 mm. long, tomentose with spreading hairs. *Sepals* 5-7 mm. long, 3 mm. broad, ovate, concave, acute or obtuse, tomentose with spreading hairs, two of the sepals united. *Petals* white 1.1-1.5 cm. long, 2 mm. broad, oblong, linear-oblong or linear, narrowing sometimes into a linear claw below, subostuse or acute, villous. *Filaments* 0.8-1.2 cm. long, terete and glabrous in the upper half, expanded villous and monadelphous in the lower half; anthers 1.5 mm. long, oblong in outline. *Ovary* densely villous; style 8 mm. long, densely villous below, glabrous or almost so above; stigma subglobose or globose. *Fruit* 2.2 cm. long, about 2.2 cm. in diameter, subglobose; the valves covered with woody protuberances. *Seed* 1.2 cm. long, about 6 mm. in diameter, more or less keeled on one face, convex on the other, reddish with a yellow arillus at the base.

Komgha Div., Komgha, on Alan Page's farm "Goldust," May (in leaf only), *Galpin*, 8470; Prospect, near Komgha, September, *Flanagan*, 309; Instsubani Forest, February (fruit), *Leigh in Herb. Forest Dept.*, 1840; Wilo Forest, Mqanduli Dist., *Kriel in Herb. Forest Dept.*, 1772; Mboleni Forest, Notineela, October, *Fegen in Herb. Forest Dept.*, 1771; Manina Forest, Engcobo Dist., August, *Zahn in Herb. Forest Dept.*, 2047 (leaf); Cwebe Forest, January (fruit), *Pretorius in Herb. Forest Dept.*, 1854.

Gerrard 1428 from Natal. Description of branches and leaves by Baker in *Journ. Bot.*, Jan., 1907, p. 15.

Arbor vel frutex? Ramulis cortice griseo tectis; foliis saepissime 4-jugis cum impari petiolulato, foliolis petiolulatis oblongis apice apiculatis lateralibus aliquantulum inaequilateracibus oppositis vel passim alternis basi cuneatis vel interdum rotundatis coriaceis margine integris vel plus minus serratis costa superne impressa subtus subconspicua nerviis secundariis tenuibus inter se juxta marginem anastomosantibus foliolis terminalibus oblongo-oblanceolatis foliolis proximis quam distalibus minoribus; rachi omnino exalata.

I have seen a specimen in leaf only (*Zahn in Herb. Forest Dept.*, 2037) which agrees with the above description, except that the leaves are 6-jugate. The leaflets which appear to be young have a long hairy apiculus, and are either entire or serrated in the upper half. In *Tyson*, 6216, in the Bolus Herb. on which Oliver founded his *B. tysoniana*, I find that some of the leaflets have this hairy apiculus and some are also toothed, so that it would appear that Baker is correct in regarding *Gerrard*, 1428, as near *B. tysoniana*, and I am of opinion that it is this species. The distribution of *B. tysoniana* suggests that it will probably be found in Natal.

A REVISION OF THE AFRICAN SPECIES OF SESBANIA.

By E. P. PHILLIPS, Division of Botany, Pretoria, and J. HUTCHINSON (Kew).

THE present paper is an attempt to revise the African species of the genus *Sesbania*, family *Papilionaceae*. Imperfect as it may prove to be, it is long overdue, chiefly because of the great accumulation of herbarium material since the publication of the second volume of the "Flora of Tropical Africa" in 1871, much of this material having remained unnamed or imperfectly determined. The results of this investigation might very well have been more satisfactory to the authors had there been more field notes available regarding the situation, habit, floral colouring, etc., of the specimens accumulated in the various herbaria which they have been able to consult.* That this information is vital in the determination and limitation of the species of *Sesbania*, at least, has been well demonstrated by Prain † in his critical elucidation of the Indian species.

The genus *Sesbania* contains about fifty species which occur in the warmer parts of the world, mainly in or by the sides of streams, lakes, and swamps. It appears to attain its greatest development in tropical Africa, a few of the species extending into South Africa as far as Natal, and into various parts of the Transvaal and Bechuanaland. In the present revision of the species from this area twenty-three are recognized to be distinct. They belong to two sections, nineteen to *Eusesbania* and four to *Daubentonia*, the latter characterized by its four-winged fruits. The third and purely American section into which *Sesbania* was divided by Bentham and Hooker (Gen. Pl., I, 502) is now recognized by American botanists ‡ as a distinct genus, *Glottidium*, and the present authors' views coincide in respect to this. They cannot, however, go so far as to accept the American view regarding the generic status of *Daubentonia* which occurs in the three widely separated areas, namely, the south-eastern United States and Mexico, sub-tropical South America, and tropical East Africa. This broken distribution seems to point to a separate origin of the species of *Daubentonia* from the basal stock, *Eusesbania*, species of which occur in all these areas. *Glottidium*, on the other hand, a native of Florida, is well separated from *Sesbania* by its short fruits with only two seeds and the manner of dehiscence, the seeds remaining inside the dry bladder-like endocarp which detaches itself as a whole from the outer shell.

In the case of the African species we have found a most useful and constant character in the nature of the appendages on the claw of the vexillum. In the first five species shown in the key these are long and quite free from the vexillum in their upper half. In

* For the privileges of examining the specimens under their charge, the authors tender their thanks to Sir David Prain, Director, Royal Botanical Gardens, Kew; Dr. A. B. Rendle, Natural History Museum, South Kensington; Dr. I. B. Pole Evans, Director, Botanical Survey, South Africa; Mrs. Bolus, Bolus Herbarium, Capetown; Dr. L. Perinquey, South African Museum; Dr. Schönland, Albany Museum, Grahamstown; the Director, Transvaal Museum, Pretoria; and Mr. Fred Eyles, Salisbury, Rhodesia.

† Prain in Journ. Anat. Soc., Bengal, LXVI, 366-370 (1897).

‡ Small, Fl. South-Eastern Unit. States, Ed. II, 615 (1913).

all the other species they are sessile and adnate to the claw, whilst they are not perceptible in one species, *S. leptocarpa*. These appendages on the claw of the vexillum in *Sesbania* are probably closely connected with pollination, and no doubt, as in some other *Leguminosae*, their function is to clasp and lift open the free stamen in order to give insects ready access to the nectaries.

We have considered it sufficient to restrict ourselves in regard to synonymy to those names to which have been applied to the African species.

KEY TO THE AFRICAN SPECIES OF *SESBANIA*.

I. *Eusesbania*.—Fruits not winged on the margins of the valves (in *S. sphaerocarpa* fruits acutely keeled down the middle of the valves).

Appendages of claw of vexillum free in their upper half or third:

Vexillum yellow, plain or finely speckled on the back with dark spots:

Stems and leaves rather densely villous pubescent:

Flowers solitary or in pairs; leaflets 5–10 pairs, stipules deciduous; appendages to vexillum obtuse..... 1. *S. Goetzei*.

Flowers several in each inflorescence; leaflets more than 10 pairs; stipules persistent; appendages to vexillum acutely acuminate..... 2. *S. speciosa*.

Stems and leaves glabrous or nearly so:

Inflorescence branched; peduncles smooth; West African species..... 3. *S. punctata*.

Inflorescence not branched:

Peduncles smooth..... 4. *S. aegyptiaca*.

Peduncles aculeate..... 5. *S. Dummeri*.

Vexillum and tips of wings suffused throughout with dark purple..... 4. *S. aegyptiaca*
var. *bicolor*.

Appendages of vexillum wholly adnate to the claw or absent:

Flowers very large, 5–10 cm. long; fruits about 30 cm. long; leaflets 3–3.5 cm. long; cultivated species..... 6. *S. grandiflora*.

Stipules foliaceous, broad, about 1 cm. long, more or less persistent:

Peduncles smooth:

Flowers pale blue, not speckled..... 7. *S. caerulescens*.

Flowers yellow, vexillum speckled..... 8. *S. cineresens*.

Peduncles strongly aculeate..... 9. *S. macrantha*.

Stipules more or less subulate, never foliaceous, and mostly soon falling off:

Stems and leaves or leaves only rather densely pubescent:

Calyx glabrous outside:

Pod not torulose..... 10. *S. pubescens*.

Pod strongly torulose..... 11. *S. Dalzielii*.

Calyx pubescent outside..... 12. *S. Wildemannii*.

Stems and leaves glabrous or only slightly pubescent:

Leaflets usually well over 1 cm. long; leaves nearly always as long or longer than the inflorescence:

Valves of the fruit not keeled down the middle:

Appendages absent from the claw of the vexillum; fruits torulose, much constricted between the seeds..... 13. *S. leptocarpa*.

- Appendages present on the claw of the vexillum :
 Margins of the fruits straight :
 Fruits about 7 mm. broad ; seeds separated
 by partitions of the endocarp ; stems and
 leaf-rachis never aculeate 14. *S. pachycarpa*.
 Fruits 3 mm. thick, seeds not separated ;
 stems and leaf-rachis often aculeate.... 15. *S. aculeata*.
 Margins of fruits much constricted between the
 seeds..... 16. *S. arabica*.
 Valves of the fruits sharply keeled on the back,
 Angolan, species..... 17. *S. sphaerocarpa*.
 Leaflets very small, averaging about 5 mm. long ; leaves
 much shorter than the inflorescence :
 Vexillum mottled with purple spots..... 18. *S. microphylla*.
 Vexillum striate, not mottled..... 19. *S. mossambicensis*.

II. *Daubentonia*.—Fruits broadly winged on the margins of the
 valves ; peduncles aculeate towards the base.

- Stems not aculeate ; peduncles aculeate only near the base :
 Leaves much shorter than the fruits ; inflorescence very
 few (1–3) flowers ; N.E. Tropical Africa..... 20. *S. tetraptera*.
 Leaves much longer than the fruits ; inflorescence several
 flowered ; Zambezi basin..... 21. *S. Kirkii*.
 Stems aculeate :
 Leaflets about 18 pairs ; inflorescence up to 11 cm. long ;
 staminal sheath shorter than the free parts of the filaments.. 22. *S. hamata*.
 Leaflets about 10 pairs or less ; inflorescence 1–3 flowered,
 very short ; staminal sheath longer than the free part of
 the filaments..... 23. *S. Rogersii*.

EUSESBANIA.

1. *Sesbania Goetzei*, Harms., in Engl. Bot. Jahrb., XXX, 327 (1902).

A shrub 2–3 m. high, branchlets rather densely and softly grey-pubescent, the older ones becoming striate or somewhat angular. Leaves shorter than the inflorescence, 3–5 cm. long ; rachis and leaflets densely and softly grey-pubescent ; leaflets about 6–10 pairs, shortly stalked, oblong, rounded and unequal-sided at the base, rounded and very minutely mucronate at the apex, 1–1.5 cm. long, 3–6 mm. broad ; stipules soon falling off, triangular-lanceolate, acute, 3–4 mm. long, pubescent ; stipules minute. Inflorescence mostly two-flowered, axillary ; peduncle softly pubescent ; pedicels about 5 mm. long, with two linear-lanceolate fugacious bracteoles towards the apex. Flower buds ellipsoid, turbinate at the base, subacute at the apex. Calyx widely campanulate, abruptly contracted into a solid turbinate base, about 5 mm. long, with five acute subulate-triangular lobes scarcely 1.5 mm. long, sparsely pubescent outside. Vexillum large, orbicular, about 3 cm. long and broad, strongly and closely mottled with purple, with two free linear curved obtuse appendages towards the base about 7 mm. long. Alae about 2.5 cm. long and 8 mm. broad. Carina 3 mm. long, the claw slightly longer than the broadly boat-shaped limb. Staminal-sheath 2 cm. long, free parts of filaments curved upwards and about 8 mm. long. Ovary with a very thin line of hairs along the top ; style glabrous. Fruits not known.

TROPICAL AFRICA : Tanganyika Territory, Ubungu, Rukwa Lake, moist banks, 800 m., July, W. Goetze, 1115 (type). British East Africa, between Kikuyu and Eldama Ravine, 1898, A. Whyte ; Eldama Ravine, A. Whyte.

A very beautiful species with short leaves, few hairy leaflets, large handsome flowers, the standard petals densely mottled with purple.

2. *Sesbania speciosa*, Taub., ex Engl. in Abh. Preuss. Akad. Wiss., 1894, 21, 42, et in Engl. Pflanzenw. Ost-Afr. C. 213 (1895); *S. Hildebrandtii* Taub., l.c.

Branchlets flexuose, obtusely angular, shortly pubescent. *Leaves* about as long as the inflorescence up to 15 cm. long; rachis and leaflets on both sides fairly densely pubescent; leaflets about 15 pairs, stalked, narrowly oblong, slightly narrowed and almost equal-sided at the base, acutely mucronate at the apex, 2–2.5 cm. long, 6–8 mm. broad; stipules persistent, obliquely lanceolate, very acutely acuminate, 1–1.3 cm. long, about 4 mm. broad at the base, adpressed-pubescent on both sides; stipels minute. *Inflorescence* 6–10 flowered, axillary; peduncle stout towards the base, pubescent; pedicels about 1.5 cm. long, nearly glabrous; bracts persistent, linear, about 6 mm. long, pubescent, margins membranous towards the base; bracteoles deciduous. *Flower buds* not seen. *Calyx* widely campanulate from an acute turbinate base, about 8 mm. long, with five subulate acute teeth about 1.5 mm. long, glabrous outside. *Vexillum* (probably yellow) finely mottled with purple, rather broadly elliptic, shortly clawed, 3 cm. long, 2 cm. broad, with two linear free appendages at the base. *Alae* 3.5 cm. long, 8 mm. broad. *Carina* 3 cm. long, the boat-shaped limb a little longer than the claw. *Staminal-sheath* 2.5 cm. long. *Ovary* slightly hairy. *Fruit* up to nearly 33 cm. long, about 8 mm. broad, rather thick, with undulate edges, nearly glabrous. *Seeds* somewhat kidney-shaped, dark brown.

TROPICAL AFRICA: East African Protectorate, Usambara; Maschena, in meadows, July, 1893, C. Holst, 3508; banks of the Kingani, 6 ft. high, fl. and fr., Hildebrandt, 960 (Herb. Mus. Brit.).

3. *Sesbania punctata* D.C. Prodr., ii, 265 (1825); Baker in Oliv. Fl. Trop. Afr., ii, 133 (1871), partly.

A shrub or slender tree, growing on banks of streams; branches pale straw-coloured when dry, slightly flexuous, sometimes slightly muricate below the leaves, otherwise glabrous. *Leaves* shorter than the inflorescence, 7–10 cm. long; rachis pubescent on the upper side, soon becoming nearly glabrous, not prickly; leaflets 12–22 pairs, shortly stalked, oblong-linear, a little narrowed and sub-equal-sided at the base, shortly and acutely mucronate at the apex, 1.2–2 cm. long, 3–5 mm. broad, glabrous or slightly pubescent on the thickened mid-rib and margins, stipules deciduous, recurved, about 3 mm. long, slightly pubescent; stipels very minute. *Inflorescence* mostly branched, longer than the leaves, up to 20-flowered, often about 12-flowered; peduncle glabrous or very slightly pubescent, especially at the base, not prickly; pedicels slender, up to 2 cm. long, glabrous, with two small caducous bracteoles towards the apex; bracts small and early caducous. *Flower buds* broadly ellipsoid, obtuse, glabrous. *Calyx* broadly campanulate from a turbinate base, about 6 mm. long, with five rather short broadly triangular lobes slightly puberulous on the margins. *Vexillum* finely mottled with purple, about 2.5 cm. long, rather shortly clawed, with two large free acuminate appendages about 5 mm. long at the base. *Alae* 2.3 cm. long, about 6 mm. broad. *Carina* more or less broadly spoon-shaped, 2.5 cm. long, the claw slightly longer than the limb. *Staminal sheath* 2 cm. long, free part of the filaments about 5 mm. long. *Ovary* and style glabrous. *Fruits* up to 24 cm. long, slender, at first torulose, but sometimes becoming nearly straight when ripe, beaked for some time by the persistent style. *Seeds* dark brown, about 4.5 mm. long.

TROPICAL AFRICA: Senegambia: Without definite locality, Perrottet 231 (type); 1839, Guillemin (H.K.) Hendelot (H.K.). Roger in Herb. Gay (H.K.); Richard-tol, 26th January, 1823, Dollinger (H.K.). Northern Nigeria. Sokoto Province, shrub or slender tree overhanging rivers, December, 1910, J. M. Dalziel 324; Abinsi and vicinity, banks of streams, common, 15th December, 1912, J. M. Dalziel 613; Katagum District, banks or streams, J. M. Dalziel 7, Benne River, October, 1907, C. A. Parsons 154, Nupe, sand banks, small shrub with yellow flowers, 1858, C. Barter, 970.

Vernacular: "Alambo." (Dalziel 324, 613).

Sesbania punctata * D.C., has been much misunderstood in herbaria, and has been considered to be widely distributed over tropical Africa and other countries. This is not, however, the case, and it appears to be confined to the banks of streams, in the Savannah country from Senegambia to Northern Nigeria, probably as far as Lake Chad or may be further. Parsons (No. 154) says it is a very common river shrub, 10 ft. high or so, overhanging and sometimes forming dense impenetrable hedges.

The species may be at once recognized by its small *branched inflorescence*, *mottled standard-petal* with very long *free-appendages* and *smooth* (not aculeate) peduncles.

4. *Sesbania aegyptiaca* Poir. Encyc., vii, 128; Pers. Syn., ii, 316; D.C. Prodr., ii, 264 (1825); Baker in Oliv. Fl. Trop. Afr., ii, 134 (1871); Prain in Journ. As. Soc., Bengal, lxvi, 367 (1897).

A tall shrub or small tree. *Branches* pilose or pubescent, rarely almost glabrous, usually ribbed. *Leaves* 3·5–13 cm. long, petiole 0·3–1 cm. long, pubescent or villous; rachis flattened or grooved above, pilose, rarely glabrous; leaflets 9–27-jugate; subsessile, 0·6–2·8 cm. long, 1·5–6 mm. broad, oblong, truncate, rounded, or sometimes retuse at the apex, apiculate, scarcely narrowed to the base, pubescent beneath, pubescent or glabrous above, not punctate with minute black dots, with the mid-rib distinct beneath; the terminal leaflets somewhat oblong-obovate. *Stipules* about 5 mm. long, ovate, acuminate, pubescent, usually deciduous, if persistent then coiled. *Inflorescence* an axillary raceme, 2–10 cm. long, 3–8-flowered, usually longer than, sometimes shorter than, the subtending leaf, the base of the peduncle densely or scantily pilose, otherwise usually glabrous. *Bracts* 3–4 mm. long, ovate, acuminate, acute, pilose, deciduous; bracteoles 1·5 mm. long, linear, pubescent without, deciduous. *Pedicels* 0·5–1·5 cm. long, glabrous. *Calyx-tube* 3–5 mm. long, 5–7 mm. in diameter, glabrous, truncate, with five small teeth or lobes 1 mm. long, ovate, usually minutely ciliate. *Vexillum* 1·1–1·9 cm. long, 1·2–1·9 cm. broad, obovate, suborbicular, or transversely oblong, rounded and usually retuse at the apex, with a short claw 2–3 mm. long and with two free appendages above the claw; alae 1·3–1·8 cm. long, 3–6 mm. broad, oblong, rounded or retuse at the apex, with a curved linear claw 5–6 mm. long, and with a projecting tooth from the base of the lamina forming a horse-shoe-shaped loop with the claw; carina 1·4–1·5 cm. long, 5–6 mm. broad, almost plano-convex in outline, with a linear claw 6–8 mm. long, and a projecting tooth from the lamina forming a horse-shoe-shaped, or distinct, loop with the claw. *Staminal-sheath* 0·8–1·1 cm. long, 2–3·5 mm. broad at the base, with evident or distinct veins; free portion of filaments arcuate; anthers 0·75 mm. long, oblong; free stamen bent near the base. *Ovary* 1·1–1·3 cm. long, sub-compressed, glabrous, with two longitudinal bands; style 3–5 mm. long, arcuate; stigma small, capitate. *Fruit* twisted, 6–14 cm. long, 3–4 mm. thick, subterete, long-acuminate, acute, glabrous, divided into compartments within. *Seeds* oblong, truncate at both ends, reddish-brown, 4 mm. long, 2 mm. broad, glabrous.

TROPICAL AFRICA: Senegambia: Perrottet, Sierra Leone, Vogel 24. Northern Nigeria: Kontagora, shrub or tree by streams, J. M. Dalziel 38; 50 miles from Maifoni, Bornu, A. C. Parsons. Lake Chad and Bornu, Talbot 1242. Attah, branched shrub, Vogel 45. Congo: Burton; Stanley Pool, Hens 348. Angola Kiteve, Kunene River, Baum 955. Eastern Sudan: Kordofau, Pfund 404; Kotschy 72, 223, 347, 539, White Nile. Brownell; Lynes; Schweinfurth 998; Muriel 107; Kassala, Schweinfurth, tree near wells, Mut Oasis; Daklila, MacDougal and Sykes 187 (Herb. Mus. Brit.), Khartoum, Schweinfurth 865. Sedan, Schweinfurth 537. Blue Nile, Muriel, 69; Schweinfurth 962; near Matamma, Schweinfurth 1865. Colonia Eritrea: Adi Gana, Pappi 192; Abyssinia: Cockburn; Quartin-Dillon and Petit 167; Wellby; Schweinfurth and Riva, 681. British East Africa: various localities; James; Elliot 313; Whyte-Grenfell; Dümmer 1781, 2008; Dowson 336;

* De Candolle's description reads as follows:—

S. punctata, herbacea glabra, foliis oblongo-linearibus obtusissimis mucronatis, 10–30-jugis, petiolo laevi superne pubescente, racemis multifloris, corolla calyce sextiplo longiore, leguminibus compressis subtorulosis rachi duplo triplove longioribus—in Senegal. (Perrottet), Flores flavi lin. 8–9 longi, vexillo punctis purpureis extus maculato (v.s. comm. a cl. Perrottet).

Kassner 623, 628, Uganda; *Speke and Grant* 710; *Whyte*; *Scheffler* 227; *Scott Elliot* 7547, 6560, *Dümmer* 225; *Bagshawe* 491, 99, Tanganyika Territory; *Hildebrandt* 961; *Holst* 3442; *Riddelsdell* 150; *Goetze* 53; Rhodesia: *Livingstone, Rogers*, 7227; Victoria Falls, *Allen* 7; *Flanagan* 3084, 3113; *Galpin* 7046; *Kolbe* 3132; *Lamb* 2293; *Rogers* 5099, 5095, 7407, 13127, 13190, 13289, 13465; Matoppos Hills, *Rogers* 5159. Portuguese East Africa: *Kirk*; *Rikatla, Junod*, 229; Delagoa Bay, *Scott*, Lourenço Marques, *Schlechter* 11585; *Bolus* 7728. Maputa River, *Maputaland Exped. in Herb. Transvaal Mus.* 14402. Gazaland: Lower Buzi, *Swynnerton* 1393.

SOUTH AFRICA: Transvaal: Messina, *Rogers* 19404, Komatipoort, *Rogers* 423, 440, and in *Herb. Transvaal Mus.* 2604, Crocodile Poort; *Galpin* 1074; *Bolus* 7727, Barberton; *Pole Evans* 2944; Sheba Siding, *Thorncroft in Herb. Transvaal Mus.* 18235. Barberton, *Rogers* 20314. Swaziland, *Miss Stewart in Herb. Transvaal Mus.* 8975. Natal: Unilalasi, *Wylie in Herb. Wood* 8551; near Stanger, *Wood* 3859; near Durban, *Gueinzus*; *Gerrard* 1070; Umgeni, *Wood* 9562.

Var. *bicolor*, *Wight and Arn. Prodr.* 214 (1834); *Prain in Journ. As. Soc., Bengal*, lxi, 367 (1897). *Sesbania atropurpurea*, *Taub.* in *Engl. Bot. Jahrb.*, XXIII, 188 (1896); like the typical form in vegetative characters, but the standard petal entirely suffused with purple.

TROPICAL AFRICA: Senegal: *Perrottet* 232. Egyptian Sudan: Khartoum, in the garden of the Catholic Monastery and cultivated in the gardens below the town on the Blue Nile, 20–30 ft. high, *Schweinfurth* 796, 779. Cordofan, *Kotschy* 35.

SOUTH AFRICA: Natal: near Durban, *Wood* 8890.

A common species in most tropical countries. The tropical form of *Sesbania aegyptiaca* is said to have uniformly yellow flowers; a second form described by Persoon as *S. picta* has the standard finely mottled with purple. Whilst we have not considered it worth while to distinguish these two conditions, owing to the difficulty of determining them from dried specimens, we have maintained the var. *bicolor* of Wight and Arnot, which is probably only found in cultivation, and has the standard petal entirely suffused with purple. In Africa, as in parts of India, the mottled form appears by far the most common.

According to *Prain (l.c.)*, *S. aegyptiaca* is a very familiar hedge plant in Indian fields and gardens. Its wood is still (in India) highly reputed as a source of charcoal for gunpowder manufacture.

5. *Sesbania Dummeri** n. sp.

A slender shrub up to 5 cm. high, branchlets glabrous except when quite young; nearly terete. Leaves shorter or nearly as long as the inflorescence, 8–11 cm. long; rachis glabrous or slightly pubescent, not prickly; leaflets 14–16 pairs, stalked, oblong-linear, slightly narrowed and sub-equal-sided at the base, rounded and distinctly mucronate at the apex, 1.5–2 cm. long, about 4 mm. broad, glabrous or with a few minute hairs on the margin; stipules sub-persistent, linear or linear-lanceolate, acutely acuminate,

* *Sesbania Dummeri* *Phillips et Hutchinson*, sp. nov.

Affinis *S. punctata* DC. et *S. aegyptiaca* Poir., sed ab. ambilus pedunculis basin versus aculeatis inflorescentiis simplicibus differt.

Frutex gracilis usque ad 5 m. altus; ramuli maturi glabri, fere teretes. *Folia* inflorescentia breviora vel fere aequilonga; rachis glaber vel leviter pubescens, haud aculeatus; foliola 14–16-juga, petiolulata oblongo-linearia, basi leviter attenuata et subaequilata, apice rotundata et mucronata, 1.5–2 cm. longa, circiter 4 mm. lata, marginibus glabris vel minute pubescentibus; stipulae subpersistentes, lineares vel lineari-lanceolatae, acutae acuminatae, 7–10 mm. longae, sicco-brunneae, parce ciliolatae; stipellae minutae. *Inflorescentia* racemosa, folia aequilonga vel longior, usque ad 8-flora; pedunculi basin versus aculeati, pedicellis gracilibus, usque ad 1 c. longis, apicem versus bracteolis parvis caducis munitis; bractae mox caducae. *Alabastra* oblique ellipsoidea, apice obtuse contracta. *Calyx* e basi turbinato late et leviter oblique, campanulatus, circiter 7 mm. longus, lobis 5 late triangularibus mucronulatis marginibus intra puberulo-ciliatis. *Verillum* flavum, brunneo maculatum, circiter 2.5 cm. longum, breviter unguiculatum, ungue appendicibus oblique lanceolatis liberis circiter 7 mm. longis munito. *Alae* 2.5 cm. longae, circiter 7 mm. latae. *Carina* 2 cm. longa, limbo rhomboideo. *Tubus staminalis* 2 cm. longus, filamentorum partibus liberis 6 mm. longis. *Ovarium* et stylus glaber. *Fructus* junior leviter torulosus, maturus non visus.

7–10 mm. long, brown when dry, sparingly ciliolate; stipels minute. *Inflorescence* racemose, as long or longer than the leaves, up to about eight-flowered; peduncle finely prickly, especially towards the base; pedicels slender, up to 1 cm. long, with two small caducous bracteoles towards the apex; bracts very early caducous. *Flower-buds* obliquely ellipsoid, obtusely contracted at the apex. *Calyx* broadly and slightly obliquely campanulate from a turbinate base, about 7 mm. long, with five broadly triangular mucronulate lobes puberulous-ciliolate within the margin. *Vexillum* yellow, finely mottled with brown, about 2.5 cm. long, rather shortly and broadly clawed, with two large obliquely lanceolate free appendages about 7 mm. long. *Alae* 2.5 cm. long, about 7 mm. broad. *Carina* 2 cm. long, the claw about as long as the more or less rhomboid limb. *Staminal sheath* 2 cm. long, free parts of the filaments 6 mm. long. *Ovary* and style glabrous. *Young fruits* slightly torulose; mature ones not seen.

TROPICAL AFRICA: Uganda: Kirerema, 4000 ft., margins of swamps, flowers yellow, spotted with brown, September, 1913, *R. Dümmer* 225. Without definite locality, *A. Whyte*.

6. *Sesbania grandiflora* Poir. Encycl., vii, 127 (1806); Pers. Syn., ii, 316 (1807).

A small tree or shrub; branchlets rather thick, very shortly and softly pubescent when young. *Leaves* much longer than the inflorescence, up to about 20 cm. long; rachis subterete, slightly pubescent or glabrous; leaflets about 15–20 pairs, stalked, rather elongate-oblong, rounded and slightly unequal-sided at the base, rounded and minutely mucronate at the apex, about 2.5–3 cm. long and 0.5–1 cm. broad, thinly chartaceous, shortly pubescent or glabrous, often glaucous, with about six pairs of lateral nerves; stipules deciduous; stipels subulate, minute. *Inflorescence* few-flowered, axillary; peduncle softly pubescent. *Flowers* large and showy, usually about 10 cm. long, pink or red. *Fruits* about 30 cm. long, flat.

This well-marked species, the native country of which is doubtful, is widely cultivated in the tropics for its handsome flowers. The leaves are often used as a substitute for spinach. We have seen African specimens from Senegambia (Herb. Gay), Gold Coast (Axim, *T. F. Chipp*, 391), and Lagos (*Dr. J. W. Rowland*).

7. *Sesbania caerulescens* Harms in Warb. Kunene-Sambesi Exped., 260 (1903). *S. Hockii*, De Wild, in Fedde Rep., XI, 544 (1913).

An erect plant about 3–5 m. high (*Eyles*); stems ribbed, glabrous, marked with brown lines. *Leaves* 5–13 cm. long; petiole 0.8–1.1 cm. long, glabrous; rachis channelled above, glabrous; leaflets 10–18-jugate, subsessile, 0.3–1.8 cm. long, 1.5–5 mm. long, oblong, obtuse, with an acute apiculus 0.5 mm. long, slightly narrowed at the base, punctate above with minute black dots, glabrous. *Stipules* 7 mm. long, oblanceolate, with a long point striped with brown, glabrous, deciduous. *Inflorescence* an axillary raceme, 4–6.5 cm. long, 1–4-flowered, as long as or shorter than the subtending leaf; bracts 7 mm. long, lanceolate, long-acuminate, striped with reddish-brown, glabrous, deciduous; bracteoles 3 mm. long, linear, otherwise similar to the bracts; pedicels 0.8–2.3 cm. long, glabrous. *Calyx-tube* spotted, 6–7 mm. long; 6.5–7 mm. broad, campanulate, glabrous; teeth 3 mm. long, ovate, acuminate, acute, ciliated. *Vexillum* a "washed-blue" (*Eyles*), spotted, 2.5–2.9 cm. long, 2.4–2.85 cm. broad, rounded, retuse at the apex, with a claw 3 mm. long. *Alae* spotted, 2.5–2.6 cm. long, 0.9–1 cm. broad, obtuse, with a linear claw 5 mm. long, 2 mm. broad, and with a downward projecting tooth. *Carina* spotted, 2–2.5 cm. long, 0.75–1.1 cm. broad, obtuse, with a linear claw 1–1.2 cm. long and a tooth from the lamina slightly projecting upwards. *Staminal sheath* 1.7–2 cm. long, 3–4 mm. broad at the base, with the free portion of the filaments arcuate; free stamen curved at the base. *Ovary* spotted, 1.7–2 cm. long, subcompressed; style 7–8 mm. long, acute, glabrous; stigma small, ellipsoid. *Fruit* 23–25 cm. long, 3.5–4 mm. broad, linear, long acuminate, with a broad suture on one side, somewhat keeled on the other, glabrous. *Seeds* dark reddish-brown, 5 mm. long, 2.5 mm. broad, oblong, slightly narrowed at each end, glabrous.

TROPICAL AFRICA: Angola: Miame River at Kavamba, 1175, m., swampy ground, March, 1900, *Baum* 782 (type). River Kumpulua-Kuito, *Gossweiler* 3195. Luco plantations, an annual, erect, glaucous green herb up to 15 ft. high, fls. pale blue, in inundated marshes, February, 1906, *Gossweiler* 3745 (Herb. Mus. Brit.). Congo State: between Chiniamia and Elisabethville, *Hock*. Rhodesia: Salisbury, April, *Flanagan*, 3121; Cleveland Dam. In colonies on moist land 5000 ft., 10 ft. high, February, *Eyles*, 600.

8. *Sesbania cinerascens* Welw. ex Baker, in Oliv. Fl. Trop. Afr., ii, 134 (1871); Hiern in Cat. Afr. Pl. Welw., i, 231, under *Sesban* (1896).

A tall arborescent herb or shrub up to 5 m. high, ashy grey in colour. Branches glabrous, smooth. Leaves 10–24 cm. long, 14–30-jugate; petiole 1–2.5 cm. long, glabrous; leaflets 14–30 pairs, subsessile, oblong or oblong-linear, rounded above, minutely punctate, usually unequal at the base, 0.7–2.8 cm. long, 3–8 mm. broad, glabrous, with the mid-rib distinct beneath. Stipules foliaceous, 1–2 cm. long, ovate, acuminate, soon deciduous. Inflorescence axillary, racemose, 11–24 cm. long, rarely only 7 cm. long, longer or shorter than the subtending leaf; peduncle glabrous; pedicels 1–2 cm. long, glabrous; bracts 1.5–5 mm. long, setaceous, caducous. Flowers yellow. Calyx-tube 5–6 mm. long, campanulate, with five distinct veins, glabrous; lobes 1.5–2 mm. long, ovate, acute, woolly-ciliate. Vexillum spotted, 1.8–2.1 cm. long, 1.7–2.2 cm. broad, obovate, retuse at the apex, narrowed into a short claw, with two ridges above the claw; alae 1.8–2 cm. long, 6–7 mm. broad, oblong or oblong-obovate, rounded above, produced into a curved claw 5–6 mm. long, with a downward projecting tooth above the claw; carina 1.7 cm. long, obtuse, produced into a linear claw 1 cm. long, and with a downward projecting tooth above the claw. Staminal sheath 1–1.2 cm. long, 3.5–6 mm. broad at the base; free portion of filaments arcuate; anthers 0.5 mm. long, oblong. Ovary 0.9–1.4 cm. long, linear, with two longitudinal bands; style 5 mm. long, at right angles to the ovary; stigma small, capitate. Fruit 26 cm. long, semi-terete, acuminate. Seed 9 mm. long, 3 mm. in diameter, oblong, rounded at each end, glabrous.

TROPICAL AFRICA: Angola: Pungo Andongo, in thickets near the River Lombe, fl. and fr. Mar. *Welwitsch*, 1999; in bushy places by streams, near Pedra Cabondo, fl. and fr. Apr., *Welwitsch*, 2000. Rhodesia: Matoppos, c. 4000 ft., May, *Rogers* 7924; Mazoe near Salisbury, April, *Flanagan* 3122, Victoria, *C. F. H. Monro*, 1932; near Bulawayo, *Rand* 448; *Eyles* 1235, 1514.

SOUTH AFRICA: Natal: Itafamasi, *Wood*, 882, Insuzi, April, *Wood*, 5311, and in Natal Govt. Herb. 8677; Natal, *Gerrard* 32. Transvaal: Barberton Div., banks of Kaap River, 2000, September, *Galpin* 1074 B; Barberton, *Rogers* 21567, 23891; Pietersburg Div., Macoutsie River, *Breijer* in *Herb. Transvaal Mus.* 18664.

Mr. Eyles says in regard to his specimen No. 1235: "In December, 1917, I planted here several of the seeds of No. 1235 (over fourteen years old) after soaking forty-three hours in water. Germination was 100 per cent., and one of the plants has been growing since. It is about 12–15 ft. high, and in March it was profusely covered with medium-sized yellow flowers which never opened until 4.30 p.m. daily."

9. *Sesbania macrantha* * Welw., MSS. *S. punctata* Hiern. in Cat. Afr. Pl., Welw., i, 231, partly, non D.C.

* *Sesbania macrantha* Welw. mss., sp. nov. affinis *S. cinerascens* Welw. sed. caulibus et pedunculis dense aculeatis differt.

Herba usque ad 5 m. alta; rami leviter costati, plerumque aculeati. Folia 5.5–18 cm. longa; petioli 0.7–2 cm. longi, glabri vel parce aculeati; foliola 5–34-jugata, petiolulata, 0.9–2.4 cm. longa, 2–6 mm. lata, oblonga vel oblongo-linear, apice rotundata et mucronata, basi inaequalia, glabra, punctis minutis nigris; stipulae usque ad 1.4 mm. longae, lanceolatae, acuminatae foliaceae, subpersistentes. Inflorescentia 13–20 cm. longa, 6–14-flora; pedunculi inferne aculeati; bractae mox deciduae; pedicelli 0.6–1.5 cm. longi, glabri. Calycis tubus 5–6 mm. longus, campanulatus glaber, dentibus 1 mm. longis. Alae 1.8 cm. longae, 8 mm. latae, obovatae, obtusae. Carina 1.5 cm. longa, 5.5 mm. lata. Vagina staminalis 1.2 cm. longa. Ovarium compressum. Fructus 25–29 cm. longus, leviter compressus, circiter 6 mm. latus, acuminatus marginibus incrassatis. Semina 6 mm. longa, 3 mm. lata, oblonga, utrinque rotundata, glabra.

Herb. up to 5 m. high. *Branches* slightly ribbed, usually covered with prickles, glabrous. *Leaves* 5.5–18 cm. long; petiole 0.7–2 cm. long, glabrous, sometimes with a few prickles; leaflets 5–24-jugate, petiolulate, 0.9–2.4 cm. long, 2–6 mm. broad, oblong to oblong-linear, rounded and mucronate at the apex, unequal at the base, glabrous, punctate with minute black dots; petiolule 1 mm. long; stipules up to 1.4 mm. long, lanceolate, acuminate, foliaceous, subpersistent. *Inflorescence* 13–20 cm. long, 6–14-flowered; lower portion of peduncle covered with prickles; bracts deciduous, not seen; pedicels 0.6–1.5 cm. long, glabrous. *Calyx-tube* 5–6 mm. long, campanulate, five-veined, glabrous; teeth 1 mm. long, ovate, subacuminate, woolly-ciliate. *Vexillum* 1.7 cm. long, 2 cm. broad, rounded, retuse above, produced into a claw 2 mm. long; alae 1.8 cm. long, 8 mm. broad, somewhat obovate, obtuse, produced into a curved linear claw 5 mm. long, and with an inclined tooth forming a horse-shoe-shaped loop with the claw; carina 1.5 cm. long, 5.5 mm. broad, obtuse, with a downward projecting claw. *Staminal sheath* 1.2 cm. long, 6 mm. broad at the base; the free portion of the filaments arcuate; free stamen kneed near the base. *Ovary* compressed, with two longitudinal bands; style arcuate; stigma capitate. *Fruit* 25–29 cm. long, somewhat compressed, about 6 mm. broad, acuminate; the valves thickened. *Seeds* 6 mm. long, 3 mm. broad, oblong, rounded at each end, glabrous.

TROPICAL AFRICA: Uganda: Kampala, tall handsome shrub, *Scott Elliot* 7267. "Elephant grass" land near Kasala Forest, slender, up to 15 ft. high, fls. yellow, *Dümmer* 742. British East Africa: Aberdare Mts., 5000–6500 ft., *Battiscombe* 8; two days' march from Mumias, *A. Whyte*; Nyasaland: Nyika Plateau, 6000–7000 ft., *A. Whyte*; Congo: Elizabethville, *Rogers* 26224; Southern Rhodesia: Odzani River Valley, Manica Dist., *A. J. Teague* 15; Angola: Huilla, in bushy places along the banks of the River Monino, fls. and fr., *Welwitsch* 1995; Pungo Andongo, in palm groves on the banks of the River Cuanza, near Sansamanda, rather rare, *Welwitsch* 1997.

SOUTH AFRICA: Transvaal: Waterval Onder, *Jenkins in Herb. Transvaal Mus.* 6724.

This appears to be a very fine species, resembling in its aculeate stems and peduncles *S. aculeata*, but with much larger stipules, inflorescence, and fruits than in that species.

10. *Sesbania pubescens*, D C. Prodr. ii, 265 (1825); Baker in Oliv. Fl. Trop. Afr. ii, 135 (1871); Hiern. in Cat. Afr. Pl. Welw. i, 231 (under *Sesban*) (1896). *Emerus pubescens*, Schum. Guin. Pl., 354 (1827).

A slender shrub growing near water; branches ascending, slightly angular when older, finely and rather laxly pubescent; young growths densely silky-pubescent. *Leaves* three or four times as long as the inflorescence, about 12 cm. long; rachis thinly pubescent; leaflets 12–18 pairs (usually about 17 pairs), shortly stalked, elongated-oblong, rounded on one side, slightly narrowed on the other, rounded and with a prominent subulate mucro at the apex, 1.5–2.3 cm. long, 5–6 mm. broad, glabrous but densely covered with minute black spots above, adpressed silky-pubescent below; stipules soon falling off, linear-subulate, very acute, 6–7 mm. long, with narrowly membranous edges, slightly pubescent up the middle; stipels minute. *Inflorescence* about 3 cm. long, or up to 8 cm. very slender, simply racemose or rarely branched; peduncle thinly pubescent; pedicels about 5 mm. long; bracts like the stipules, but with wider membranous margins, soon falling. *Flowers* yellow, about 1 cm. long; buds ellipsoid, beaked at the apex, about 5 mm. long, glabrous. *Calyx* campanulate from a broadly turbinate base, 5 mm. long, with five broadly triangular acute lobes slightly puberulous on the margin. *Vexillum* probably not spotted, about 8 mm. long, with two wholly adnate appendages on the claw. *Alae* about 8 mm. long. *Carina* limb as long as the claw. *Ovary* and style glabrous. *Fruits* curved, about 15 cm. long, 3 mm. broad, with thickened margins, acutely beaked, glabrous. *Seeds* oblong, reddish-brown, about 3 mm. long.

TROPICAL AFRICA: Senegambia: Marshes near Nboro, 1840, *Brunner*; without locality, *Thiery*; *Perrottet* 228. Gold Coast: Accra, *T. W. Brown* 419; Axim, *T. F. Chipp* 426; Aburi Gardens, *W. H. Johnson* 950. Dahomey: Cotanou, *Debeaux* 150

(Herb. Mus. Brit.). Western Sudan: between Madoo and Berirem, *A. Chevalier* 10095. St. Thomas Island, *A. Moller* 86. Angola: Loanda; rather rare in moist sandy places (near Praia de Zamba Grande, fl. and fr. Mar., Apr., *Welwitsch* 1992. Tanganyika Territory, *Stuhlmann* 7906.

This species is distinguished especially by its very small flowers and slender inflorescences. *S. sericea* D.C. from Ceylon is a very closely allied species, with fruits usually broader than those of *S. pubescens*.

11. *Sesbania Dalzielii* * n. sp.

A slender shrub up to 2 m. high; branches weak, angular when young, slightly pubescent, at length striate. *Leaves* usually longer than the inflorescence, 15–25 cm. long; rachis and leaflets silky pubescent; leaflets up to 40 pairs, shortly stalked, linear-oblong, rounded and acutely mucronate at the apex, obliquely acute at the base, 0.8–2.5 cm. long, 2–3.5 mm. broad, coriaceous, appressed silky-pubescent on both surfaces; stipules linear-subulate, acute, very soon falling off; stipels very minute. *Inflorescence* slender and laxly flowered; the uppermost ones longer than their subtending leaves; peduncle pubescent towards the base; pedicels slender, glabrous, bibracteolate towards the apex; bracteoles linear, 2 mm. long, falling off before the flower opens. *Flower-buds* ellipsoid-turbinate, shortly acuminate, glabrous. *Calyx* campanulate, acutely turbinate at the base, 5 mm. long, glabrous outside, ciliate within the five acutely acuminate lobes. *Vexillum* with two small sessile appendages on the claw. *Ovary* glabrous. *Fruit* about 20 cm. long, strongly torulose, shortly and acutely beaked, about 25-seeded. *Seeds* oblong-ellipsoid, 5 mm. long, green and shining.

TROPICAL AFRICA: Northern Nigeria: Abinsi and vicinity in marshy places, *J. M. Dalziel* 614 (type). Katagum District, marshy places, *J. M. Dalziel* 8, "Niger," *Bakie* 9. Jeba, on the Niger, *Barter*. Western Sudan: Koulikoro, *Chevalier* 3390.

12. *Sesbania Wildemannii*, nom. nov.

Sesbania affinis De Wild, in Ann. Mus. Cong. Ser. V, 1, 141 (1904), non Schrad.

Stems terete, finely longitudinally grooved, glabrous. *Leaves* up to about 9 cm. long; rachis angular, shortly pubescent; leaflets about 20–25 pairs, linear-oblong, rounded and mucronate at the apex, obliquely unequal-sided at the base, about 8 mm. long and 2 mm. broad, grey, at length glabrous above, finely appressed-pubescent below; stipules small, deciduous. *Inflorescence* few-flowered, very slender; peduncle slightly pubescent; pedicels nodding, 7 mm. long; bracts and bracteoles deciduous. *Flowers* about 1.5 cm. long. *Calyx* ribbed, pubescent outside, with five acutely triangular teeth. *Vexillum* finely mottled outside, with two sessile appendages on the claw. *Fruits* very narrow, about 15 cm. long and 2.5 mm. broad, glabrous, straight or very slightly torulose. *Seeds* oblong, rounded at the ends, 3 mm. long, brownish.

TROPICAL AFRICA: Belgian Congo: Between Leopoldville and Mombazi, *Gillet*. 2626.

We have seen rather an imperfect specimen of this species, which appears distinct on account of its hairy calyx tube.

* *Sesbania Dalzielii*, *Phillips et Hutchinson*, sp. nov., affinis *S. pubescenti* DC., sed fructibus torulosus differt.

Frutex gracilis usque ad 2 m. altus; rami debiles, primum angulares, leviter pubescentes, demum striati. *Folia* inflorescentia plerumque longiora, 15–25 cm. longa; rachis et foliola sericeo-pubescentia; foliola usque ad 40-jugata, breviter petiolulata, lineari-oblonga, apice rotundata et acute mucronata, basi oblique acuta, 0.8–2.5 cm. longa, 2–3.5 mm. lata, coriacea, utrinque appresse sericeo-pubescentia; stipulae lineari-subulatae, acutae, mox deciduae; stipellae minutissimae. *Inflorescentia* gracilis et laxiflora; pedunculi basin versus pubescentes; pedicelli graciles, glabri, bibracteati; bracteolae lineares, 2 mm. longae, mox deciduae. *Alabastra* ellipsoideo-turbinata, breviter acuminata, glabra. *Calyx* campanulatus, basi acute turbinatus, 5 mm. longus, extra glaber, lobis 5 acute acuminatis intra ciliatis. *Vexillum* basin versus appendicibus sessilibus instructum. *Ovarium* glabrum. *Fructus* circiter 20 cm. longus, valde torulosus, breviter et acute rostratus. *Semina* circiter 25, oblongo-ellipsoidea, 5 mm. longa, viridia et nitida.

13. *Sesbania leptocarpa*, D.C. Prodr. ii, 265 (1825); Guill. et Perrott. Fl. Seneg. i, 199, (1830-33); Baker in Oliv. Fl. Trop. Afr., ii, 135, partly (1871).

Stem herbaceous, sparingly branched, glabrous, finely grooved. *Leaves* up to 9 cm. long, longer than the inflorescence; rachis very slightly aculeate towards the base; leaflets 8-18 pairs, distinctly stalked, narrowly oblong, very unequal-sided at the base, rounded and finely mucronate at the apex, 1-1.3 cm. long, about 2.5-3 mm. broad, finely punctate with numerous black spots on both surfaces, otherwise glabrous; stipules very soon falling off, linear-lanceolate, acute, about 2.5 mm. long, slightly hairy towards the tips; stipels minute, like little points. *Inflorescence* a simple raceme, about three-flowered; peduncle slender, slightly aculeate towards the base; bracts like the stipules, very soon falling off; bracteoles small, at the base of the calyx tube. *Flowers* small, about 1 cm. long. *Calyx* turbinate-campanulate, 4 mm. long, glabrous, with five triangular subacute teeth slightly puberulous on the margin. *Vexillum* suborbicular, striate and slightly punctate, about 1 cm. long; claw without appendages at the base or only slight thickenings representing them. *Alae* and keel striate. *Ovary* and style glabrous. *Fruits* 12-15 cm. long, 3 mm. broad, torulose, with a dark blotch between the joints, acutely acuminate, 14-24 seeded. *Seeds* black, 3 mm. long.

TROPICAL AFRICA: Senegambia: Moist plains around St. Louis, at north Point, near the Walo River, Richard-Tol, Dagana, etc., *Hendelot* 489; *Perrottet* 233.

This species is distinguished by its slightly aculeate peduncles, by the *absence of appendages* from the claw of the vexillum, and the torulose blotched fruits. It is apparently confined to Senegambia.

14. *Sesbania pachycarpa* D.C. Prodr. ii, 265 (1825); Guill. et Perrott. Fl. Seneg. 200, t. 50 (1830-33); Baker in Oliv. Fl. Trop. Afr., ii, 134, partly (1871). *Sesban phaeocarpus*, Hiern. in Cat. Afr. Pl. Welw. i, 232, partly, non Welw.

Stems herbaceous, pithy, glabrous. *Leaves* 40 cm. long, many times longer than the inflorescence; rachis contracted at the base, glabrous; leaflets very numerous, linear-oblong, truncate or rounded and mucronate at the apex, slightly oblique at the base, 1-2 cm. long, 3-5 mm. broad, glaucous-green, glabrous, very minutely punctate with black spots; stipules linear, nearly 1 cm. long, glabrous. *Inflorescence* short, slender, few-flowered, or sometimes reduced to two or three flowers; peduncle smooth; pedicels up to 1 cm. long, with two early deciduous bracteoles towards the apex. *Calyx* broadly campanulate, from a sharply turbinate base, 5 mm. long, finely puberulous within the margins of the acutely triangular lobes. *Petals* yellow; the vexillum densely mottled with dark spots. *Appendages* to vexillum adnate to the claw. *Fruits* erect, curved, about 15 cm. long and 7 mm. broad, when ripe acutely beaked, with straight margins to the valves, but with slight constrictions between the seeds between the margins. *Seeds* separated by partitions of the sub-membranous endocarp, broadly oblong, truncate at each end, 3.5 mm. long, rarely 3 mm. thick, pale brown.

TROPICAL AFRICA: Senegambia: *Perrottet* 230 (Herb. Mus. Brit.). Northern Nigeria: Bornu, *E. Vogel* 79; Katagum District, *J. M. Dalziel* 9; near Abinsi, *J. M. Dalziel* 615. Eastern Sudan: South Kordofan, *Pfund* 134; *Kotschy* 72. "Upper Nile," *Freeman and Lucas*. Abyssinia: Terrefera Valley, *Schimper* 775. Angola: Loanda, *Welwitsch* 1991 (Herb. Kew. non Herb. Mus. Brit.); Mossamedes, *Welwitsch* 1996b.

Known in Nigeria as "Zamarke" (*Dalziel*).

15. *Sesbania aculeata* Pers. Synops. ii, 316, partly (1807); D.C. Prodr., ii, 265 (1825); Prain in Journ. Asiat. Soc., Bengal, lxvi, 369 (1897). *Sesban punctatus*, Hiern. in Welw. Cat. Afr. Pl. i, 230, partly. *Sesban aegyptiacus* Hiern, l.c., 231, non Poir.

A weed of moist places often up to 5 m. high; stem patently branched from the base to apex, often aculeate, but sometimes smooth. *Leaves* up to 25 cm. long; rachis generally aculeate below; leaflets about thirty pairs, generally about 1.5 cm. long and

3 mm. broad, glabrous and often glaucous; stipules linear-lanceolate, very acute, about 7 mm. long, glabrous, often sub-persistent. *Inflorescence* mostly rather few-flowered and much shorter than the subtending leaf; peduncle aculeate or smooth; pedicels slender, about 5 mm. long, glabrous. *Flowers* yellow, about 1.5 cm. long. *Calyx* tube 3 mm. long, campanulate, glabrous; teeth 1-2 mm. long, subacute. *Vexillum* yellow spotted on the back, with two sessile linear appendages on the claw. *Alae* oblong or oblong-obovate. *Carina* 1.3 cm. long, 4 mm. broad. *Staminal sheath* 1-1.2 cm. long. *Ovary* glabrous. *Fruits* 15-20 cm. long, straight or slightly curved, about 3 mm. thick, tipped with a long slender acute beak. *Seeds* oblong-ellipsoid, rounded at both ends, about 3 mm. long.

TROPICAL AFRICA: Senegal, *Perrottet* 229. Sierra Leone: Falaba, *Scott Elliott* 5220; near Lusenya, about 15 ft., with purplish flowers, *Scott Elliott* 4219. Gold Coast: Accra, *Krauss*; Lagos, *J. M. Dalziel* 1227; *Macgregor* 13. French Congo: Ft. Sibut, Krebedje, *Chevalier* 5675. Cameroons: Yaunde, *Zenker and Staudt* 501. Angola: Quiballa, *Monteiro*. Mossamedes, *Welwitsch* 1996. Between Huilla Mission Station and Chibia, *H. H. W. Pearson* 2699, 2724. Golungo Alto, *Welwitsch* 1994. Mossamedes. Eastern Sudan: *Schweinfurth* 1046, 1869; *Kotschy* 539; *Brown* 1075. Abyssinia: *Quartin-Dillon and Petit* 169. Colonia Eritraea: Beni-Amer, *Pappi* 161. British East Africa: Mombassa, in damp meadows, *Hildebrandt* 1990; *Kassner* 471; *Usambara*, *C. Holst* 3212. Nyasa Highlands, *Stolz* 267. Nyasaland: *Johnson* 361; *Buchanan* 910. Rhodesia: Matopos, *Allen* 731. Ngamiland: Kwebe Hills, swampy places, *Lugard* 161, 161a, 168. Portuguese East Africa: Lourenço Marques, *Schlechter* 11585; *Wilms* 422.

SOUTH AFRICA: Transvaal: Shilovane, *Junod* 1131. Crocodile Poort, shrub 8 ft., *Galpin* 1074a. Aapies River, north of Pretoria, *A. Haagner in Herb. Conrath* 1185. Barberton Division: Nelspruit, *Rogers* 23858. Natal, *Drege*, *Sutherland*; *Gerrard* 32; *Keun*, *Wood* 287, 1593; *Gerrard and McKen*. 734.

A common weed in most tropical countries.

16. *Sesbania arabica*, *Hochst. ex Steud.*, *Nom. ed.* II, ii, 572 (1840).

Stems glabrous, rather slender, finely grooved. *Leaves* up to 15 cm. long, much longer than the inflorescence; rachis smooth; leaflets up to thirty pairs, distinctly stalked, linear-oblong, rounded and minutely mucronate at the apex, obliquely one-sided at the base, about 1.5 cm. long and 2.5-3 mm. broad, glaucous-green; stipules lanceolate, with a long linear acuminate apex, slightly pubescent on the margin, sub-persistent; stipels very minute, like little points. *Inflorescence* mostly about two or three flowered, slender; peduncle glabrous or nearly so; bracteoles paired at the base of the calyx, narrowly lanceolate, with membranous margins. *Flowers* apparently yellow; the vexillum finely mottled with purple. *Calyx* broadly campanulate from a shortly turbinate base, about 5 mm. long, slightly pubescent within the margins of the acute triangular teeth. *Vexillum* with two linear sessile appendages on the claw. *Fruits* erect, nearly straight, up to about 25 cm. long, strongly constricted between the seeds, segments about 6 mm. long. *Seeds* oblong-ellipsoid, rounded at both ends, 4.5 mm. long, dark brown, slightly shining.

TROPICAL AFRICA: Northern Nigeria: Benne Valley, Muri Province, Nov., *P. H. Lamb* 69. Eastern Sudan: S. Kordofan, *Pfund* 132, 308; *Kotschy* 47. Blue Nile, near "Camp Ardeba," *Muriel* 65. Mestra Zeraf Wood Station, *Brown* 1737. Colonia Eritrea: Beni-Amer, *Pappi* 166.

Occurs also in Southern Arabia. Arabic name, "Tawri" (*Muriel*).

17. *Sesbania sphaerocarpa* *Welw.* *Apont.* 590, No. 82 (1858); *Hiern*. in *Cat. Afr. Pl. Welw.*, i, 232, partly. *Sesbania sphaerosperma*, *Welw. ex Baker* in *Oliv. Fl. Trop. Afr.*, ii, 135 (1871).

Herb, rather woody at the base, about 30 cm. high or more; stems smooth or sparingly aculeata. *Leaves* up to 15 cm. long; rachis slightly aculeate below; leaflets up to about twenty pairs, elongate-oblong, rounded and minutely mucronate at the apex, unequal-sided at the base, 1.5–2.5 cm. long, about 5 mm. broad, pale glaucous-green, glabrous; stipules linear-subulate, acutely acuminate, about 8 mm. long, slightly hairy on the margins, soon falling off. *Inflorescence* very small, 2–3-flowered, about 1.5 cm. long; peduncle slender, slightly hairy towards the base; pedicels very slender, about 5 mm. long, glabrous; bracts and bracteoles caducous. *Calyx* widely campanulate, acutely turbinate at the base, with five short acute lobes. *Vexillum* broadly orbicular, with two sessile linear appendages on the claw. *Fruits* about 16 cm. long, 3 mm. broad, linear, acutely acuminate, with an undulate wing on the back of the valves. *Seeds* nearly rounded, small.

TROPICAL AFRICA: Angola: Loanda District, *J. Gossweiler* 253, 1479; Loanda, *Welwitsch* 1991, 1993.

18. *Sesbania microphylla*, *Harms* in *Kunene-Samb. Exped.*, 260 (1903).

An erect branching herb, up to 2 m. high; branches ribbed, glabrous. *Leaves* 2–12 cm. long; petiole 0.2–1 cm. long, glabrous; rachis flattened on the upper surface, glabrous, leaflets 5–30-jugate, subsessile, 2–7 mm. long, 0.5–2.5 mm. broad, oblong or elliptic, obtuse, shortly mucronate, slightly unequal at the base, punctate above with minute black dots, glabrous, with the mid-rib distinct beneath. *Stipules* 2.5–3 mm. long, setaceous, deciduous, or persistent. *Inflorescence* axillary, racemose, three or four flowered, 2–6 cm. long, longer or shorter than the subtending leaf; base of peduncle glabrous; bracts deciduous, not seen; bracteoles 2.5 mm. long, setaceous, persistent in mature flowers; pedicels 1–2 cm. long, glabrous. *Calyx-tube* 3 mm. long, 3 mm. in diameter, campanulate, with five broad brown bands; teeth 1 mm. long, ovate, with brown acuminate tips. *Vexillum* yellow, mottled with numerous fine purple spots on the back, 1.5 cm. long, 1.1 cm. broad, ovate-oblong, rounded above, with two adnate linear-appendages within a short claw 1.5 cm. long. *Alae* 1.6 cm. long, oblong, obtuse, with a linear claw 2.5 cm. long, and a downward projecting tooth from the base of the lamina. *Carina* 1.65 cm. long, 5 mm. broad, almost plano-convex in outline, with a linear claw 6 mm. long, and a downward projecting tooth from the lamina. *Staminal sheath* 1 cm. long, 2 mm. broad at the base, with the free portion of the filaments arcuate; free stamen slightly bent at the base; anthers 0.75 mm. long, ovate. *Ovary* 1.3 cm. long, sub-compressed, with two faint longitudinal bands; style 4 mm. long, arcuate; stigma capitate. *Fruit* 11.5–12.5 cm. long, 2.2–5 mm. broad, linear, acutely acuminate, laterally compressed, moniliform. *Seeds* dark brown, 3 mm. long, 1.5 mm. broad, oblong, rounded at both ends, glabrous.

TROPICAL AFRICA: Angola: Mouth of the Longa River, 3480 ft., 22nd December, 1899, *H. Baum* 569. Eastern Sudan: Bahr. el Ghazal, flowers yellow mottled with black, *A. F. Broun*. Rhodesia: Lomagundi, Darwendale on pierite formation, in vleis, April, *Eyles*, 695; Bulawayo, *J. S. MacDonald* in *Herb. Dept. Agric.* 4942.

19. *Sesbania mossambicensis*, *Klotzsch* in *Peters, Reise Mossamb. Bot.* 45 (1861). *Sesbania macowaniana* *Schinz.* in *Verh. Bot. Ver. Brand.* XXX, 165 (1888).

A weak sparingly branched herb about 1 m. high. *Branches* striate, glabrous. *Leaves* 1.5–11 cm. long; petiole 2–7 mm. long, glabrous; rachis flattened or channelled above, glabrous, rarely sparsely covered with hairs; leaflets 7–33-jugate, subsessile, oblong or oblong-linear, rounded at the apex, shortly apiculate, unequal at the base, glabrous, 0.3–1 cm. long, punctate with minute black dots on the upper surface, with the mid-rib distinct beneath; stipules usually persistent, 2–5 mm. long, ovate or ovate-lanceolate, acuminate, acute. *Inflorescence* an axillary raceme, 1–7 cm. long, 3–8-flowered, longer or shorter than the subtending leaf; peduncles glabrous; bracts generally persistent, 2 mm. long, linear; bracteoles persistent, 1.5 mm. long, linear; pedicels 3–7 mm. long,

glabrous. *Calyx-tube* 3-4 mm. long, 2-3 mm. in diameter, campanulate, glabrous, with five dark-brown bands; teeth 1-1.5 mm. long, acuminate from a triangular base, acute, with black tips, usually with cottony hairs on the margins. *Vexillum* striped with dark veins, but not mottled, 0.8-1.1 cm. long, 0.8-1.1 cm. broad, subrotund, obovate or transversely oblong, rounded and retuse at the apex, with a claw 2 mm. long. *Alae* 0.8-1.2 cm. long, 3-4 mm. broad, obovate or obovate-oblong, obtuse, with a linear claw 1.5-3 mm. long, and a short downward projecting tooth from the lamina. *Carina* 0.9-1.2 cm. long, 3-4 mm. broad, almost plano-convex in outline, obtuse, with a linear claw 5-7 mm. long, and a downward projecting claw from the lamina. *Staminal sheath* 0.7-1 cm. long, 1-3 mm. broad at the base, with the free portions of the filaments arcuate; free stamen dilated at the base. *Ovary* 0.7-1.1 cm. long, subcompressed, with two faint longitudinal bands; style 3-4 mm. long, arcuate, glabrous; stigma capitate. *Fruit* 4-6 cm. long, moniliform, long-acuminate. *Seeds* dark reddish-brown, 2.5 mm. long, 1.25 mm. broad, oblong, rounded at each end, glabrous.

TROPICAL AFRICA: Maniniam: On the Tubbo River, *G. Schweinfurth* 3674. Portuguese East Africa: Cabaceira Peninsula and near Quillimane, *Peters* (type). Congo: Elisabethville, *Rogers* 10872; without locality, *Rogers* 13641.

SOUTH AFRICA: Herbert Div., Biddulphis, nine miles north of Orange River at Hopetown, February, *Bolus* 1835; Gariep River, *Pappe*; Transvaal: Makapansberge, Streydpoort, *A. Rehmann* 5543. Pretoria Div., near the Aapies River, 4500 ft., January, *Schlechter* 4179; *Miss Leendertz* 3205; Pretoria, March, *Mrs. Pott in Herb. Transvaal Mus.* 11333; *Miss Leendertz* 4413; Hatherley, near Pretoria, *Rogers* 23943; Rustenburg Div., Rustenburg, January, *Playford in Govt. Herb.* 17268; Crocodile River, March, *Burtt-Davy*, 9297; Zeerust Div., Zeerust, *Rogers* 22672; Potchefstroom Div., Potchefstroom, *Miss Leendertz* 3205; Pietersburg Div., grassy plains near Pietersburg, 4000 ft., February, *Bolus* 10879. Bechuanaland: Masupa River, *E. Holub*. S.W. Protectorate: Klein Namutoni, *J. W. F. Breijer in Herb. Transvaal Mus.* 20618.

§ DAUBENTONIA.

20. *Sesbania tetraptera*, *Hochst. ex Baker* in *Oliv. Fl. Trop. Afr.*, ii, 136 (1871).

Stems ridged, otherwise glabrous, about 4 mm. thick. *Leaves* up to 12 cm. long, nearly twice as long as the inflorescence; rachis sparingly pubescent when young, soon becoming quite glabrous or with a few small prickles on the lower side towards the base; leaflets about fifteen pairs, shortly stalked, narrowly oblong, unequal-sided at the base, truncate-rounded and sharply mucronate at the apex, 1.2-2 cm. long, 3-4.5 mm. broad, glabrous, spotted with minute black dots on the upper side, with no visible nerves or veins; stipules subpersistent, subulate-lanceolate, very acute, 5-6 mm. long, very slightly pubescent inside; stipels very minute and subulate. *Inflorescence* a simple raceme, few (up to seven) flowered; peduncle up to 6 cm. long, thickened at the base and there closely beset with subulate-triangular prickles; bracts linear-subulate, about 3 mm. long, persistent; pedicels about 7 mm. long, filiform, with a pair of linear deciduous bracteoles at the apex about one-third the length of the calyx. *Calyx* campanulate, turbinate at the base, 5 mm. long, with five short triangular lobes, the latter minutely pubescent inside the margin. *Vexillum* broadly orbicular, 1.2 cm. long, cuneate into a short claw about 2 mm. long, with two linear sessile ridge-like appendages about 2 mm. long near the base. *Alae* oblong; limb 8.5 mm. long; claw bent, 5 mm. long. *Carina* broadly semilunar; limb 8 mm. long, with an acutely triangular tooth on the upper side; claw curved, 5 mm. long. *Staminal sheath* 0.8 cm. long, free part of filaments 3-4 mm. long; anthers 0.75 mm. long. *Ovary* 8 mm. long, four-winged; style bent at right angles, 3 mm. long, puberulous towards the top. *Fruits* much longer than the leaves, 15 cm. long, 1 cm. broad, broadly four-winged, stipitate, for about 1 cm. at the base, acutely acuminate at the apex. *Seeds* reddish-brown, oblong-elliptic, broadly rounded at both ends, 6 mm. long, with a small circular hilum in the middle.

TROPICAL AFRICA: Nubia: In dry limestone of Arasch-Cool, 7th October, 1839, Kotschy 131 (H.K.). "Upper Egypt and Cordofan," without definite locality, 1837-38, Kotschy 83 (H.K.).

21. *Sesbania Kirkii* * n. sp.

Stems slightly ridged or nearly smooth, not prickly, rather stout, about 5-6 mm. thick. *Leaves* up to 30 cm. long, more than twice as long as the inflorescence; rachis sparingly pilose when very young, soon glabrous or with one or two small prickles on the lower side towards the base; leaflets up to about 35 pairs, shortly stalked, elongate-oblong or linear-oblong, slightly unequal-sided at the base, rounded and mucronate at the apex, 2.5-3.5 cm. long, about 5-6 mm. broad, spotted with minute black dots on the upper surface, otherwise glabrous, with several faint lateral nerves; stipules persistent, lanceolate or linear-lanceolate, acutely acuminate, 1 cm. long, pubescent inside; stipels distinct, subulate, about 1 mm. long. *Inflorescence* several flowered, racemose, slender, up to 14 cm. long; peduncle slender, broadened towards the base and there provided with numerous subulate spreading prickles; bracts persistent, longer than the pedicels, linear-lanceolate, very acute, 5-6 mm. long, sparingly ciliate; pedicels about 4 mm. long, slender, glabrous, with a pair of persistent bracteoles a little more than half as long as the calyx. *Calyx* campanulate, turbinate at the base, 4 mm. long, with five triangular lobes about 1 mm. long, the latter minutely ciliolate. *Petals* as in *S. tetraptera* Hochst. *Fruits* much shorter than the leaves, about 15 cm. long and nearly 1.5 cm. broad, stipitate for about 1 cm. at the base, very acutely beaked, acuminate, broadly four-winged. Ripe seeds not seen.

TROPICAL AFRICA: Zambezi Basin: Tette, fls., February, 1859, Dr. J. Kirk (H.K.); near Sena, fr., June, 1859, Dr. J. Kirk (H.K.). Lower Shire, elephant marsh, especially on the banks of the river, fls. and fr., February, 1887, L. Scott (H.K.).

22. *Sesbania hamata*,† n. sp.

* *Sesbania Kirkii*, Phillips et Hutchinson, sp. nov.; affinis *S. tetrapterae*, Hochst., sed foliis, fructus brevioribus foliolis numerosissimis majoribus inflorescentiis multifloris differt.

Caulis leviter costati vel fere teretes, haud aculeati, tatis robusti, circiter 5-6 mm. crassi. *Folia* usque ad 30 cm. longa, inflorescentiae ultra duplo-longiora; rachis primum parce pilosus, mox glaber vel inferne aculeis paucis instructus; foliola usque ad 35-jugate, breviter petiolulata, elongato-oblonga vel lineari-oblonga, basi leviter inaequilatera, apice rotundata et mucronata, 2.5-3.5 cm. longa, circiter 5-6 mm. lata, supra punctis nigris minutis maculata, ceterum glabra, nervis lateralibus subdistictis; stipulae persistentes, lanceolatae vel lineari-lanceolatae, acute acuminatae, 1 cm. longae, intra pubescentes; stipellae distinctae, subulatae, circiter 1 mm. longae. *Inflorescentia* pluriflora, racemosa, gracilis, usque ad 14 cm. longa; pedunculi graciles, basin versus latiores et aculeis numerosis subulatis patulis instructi; bractae persistentes, pedicellis longiores, lineari-lanceolatae, acutissimae, 5-6 mm. longae, parce ciliatae; pedicelli circiter 4 mm. longi, graciles, glabri, apice bracteolis calyce dimidio brevioribus instructis. *Calyx* campanulatus, basi turbinatus, 4 mm. longus, lobis triangularibus 5 circiter 1 mm. longis minute ciliolatis. *Petala* ut in *S. tetrapterae*, Hochst. (supra). *Fructus* foliis multo brevior, circiter 15 cm. longus et fere 1.5 cm. latus, basi 1.5 cm. stipitatus, apice acutissime rostrato-acuminatus, late 4-alatus. *Semina* matura non visa.

† *Sesbania hamata*, Phillips et Hutchinson, sp. nov.; affinis *S. tetraptera* Hochst., sed caulibus aculeis hamatis ornatis inflorescentiis plurifloris differt.

Caulis longitudinaliter costatus, aculeis hamatis. *Folia* 9-18 cm. longa; rachis interdum aculeis paucis ornatus; foliola 14-20-jugate, subsessilia, oblonga vel lineari-oblonga, apice rotundata, distincte mucronata, 1.2-2.7 cm. longa, 2.5-6 mm. lata, supra dilute viridia, glabra; stipulae persistentes, lineis rubro-brunneis striatae, 0.6-1 cm. longae, oblique lanceolatae, acuminatae, glabrae. *Inflorescentia* axillaris, racemosa, 9-11 cm. longa, 6-9-flora, folio subtendente circiter aequilonga; pedunculi inferne aculeis numerosis hamatis instructi; bractae persistentes, circiter 5 mm. longae, lanceolatae, acuminatae, acutae, leviter ciliatae; bracteolae bracteis similes sed breviores; pedicelli 0.9-1.5 cm. longi, glabri. *Calyx* tubus 3 mm. longus, 4 mm. latus, campanulatus, glaber, dentibus 1 mm. longis ovatis acutis glabris. *Vexillum* maculatum, 1-2 cm. longum, 1.3 cm. latum, transverse oblongum, ungue 3 mm. longo; alae 1.25-1.3 cm. longae, 4 mm. latae, oblongo-ovatae, superne rotundatae, ungue lineari circiter 3 mm. longo et dente recurvato; carina 1.2 cm. longa, obtusa, ungue 5 mm. longo. *Trubus staminialis* 4 mm. longus, 3 mm. latus, filamentis superne arcuatis liberis; stamen liberum 8 mm. longum. *Ovarium* subsessile, 8 mm. longum, 4-alatum, glabrum; stylus 3 mm. longus, ab ovario sub angulo 45° divergens, pubescens, stigmate capitato. *Fructus* immaturi usque ad 9.5 cm. longi, 4.5 mm. lati, lineares, 4-alati, stylo persistente coronati.

Stem with longitudinal ridges, covered with hook-like prickles. *Leaves* 9–18 cm. long; rachis sometimes with a few hook-like prickles on the lower half; leaflets 14–20 pairs, subsessile, oblong or linear-oblong, rounded at the apex, distinctly mucronate, 1.2–2.7 cm. long, 2.5–6 mm. broad, pale green above, glabrous, with the mid-rib distinct beneath; stipules persistent, striped with reddish-brown marks, 0.5–1 cm. long, obliquely lanceolate, acuminate, glabrous. *Inflorescence* an axillary raceme 9–11 cm. long, 6–9-flowered, about as long as the subtending leaf, the lower half of the peduncle covered with numerous hook-like prickles; bracts persistent, about 5 mm. long, lanceolate, acuminate, acute, slightly ciliate; bracteoles similar to the bracts but a little shorter; pedicels 0.9–1.5 cm. long, glabrous. *Calyx-tube* 3 mm. long, 4 mm. broad, campanulate, glabrous; teeth 1 mm. long, ovate, acute, glabrous. *Vexillum* spotted, 1.2 cm. long, 1.3 cm. broad, transversely oblong, with a claw 3 mm. long, widening from the base upwards. *Alae* 1.25–1.3 cm. long, 4 mm. broad, oblong-ovate, rounded above, with a linear claw about 3 mm. long and a downward projecting tooth from the limb forming a loop with the claw. *Carina* 1.2 cm. long, obtuse, with a linear claw 5 mm. long, and with an acute tooth projecting at right angles to the limb and forming a horseshoe-shaped loop with the claw. *Staminal sheath* 4 mm. long, 3 mm. broad, with the upper half of the free filaments arcuate; free stamen 8 mm. long, dilated at the base above a short bent claw. *Ovary* subsessile, 8 mm. long, four-winged, glabrous; style 3 mm. long, bent almost at right angles to the ovary, pubescent; stigma capitate. *Young fruits* up to 9.5 cm. long, 4.5 mm. broad, linear, four-winged, tipped with the persistent style.

SOUTH AFRICA: Transvaal: Moist places near the Brak River, 2800 ft., 9th March, 1894, *Schlechter* 4620.

We have seen only one specimen of this apparently distinct species—in the Bolus Herbarium, Capetown. It extends the distribution of the group *Tetrapterae*, formerly only known by the solitary species (*S. tetraptera*) from the Nile districts, through the Zambezi Basin (*S. Kirkii* and *S. Rogersii*) into the sub-tropical Transvaal.

23. *Sesbania Rogersii* * n. sp.

Branched or unbranched plants 30–69 cm. high. *Stem* ribbed, covered with prickles, otherwise glabrous. *Leaves* 1.5–6 cm. long; rachis 3–4 cm. long, subterete; leaflets less than ten pairs, subsessile, 0.5–1.3 cm. long, 2–4 mm. broad, oblong, obtuse, shortly and bluntly mucronate, punctate above with minute black dots, otherwise glabrous, with the mid-rib distinct below; stipules setaceous, 4.5 long. *Inflorescence* an axillary raceme, 2–5 cm. long, 1–4-flowered, longer or shorter than the subtending leaf; peduncle with a few short prickles at the base; bracts 5 mm. long, lanceolate, acuminate, deciduous; bracteoles similar, soon falling off; pedicels 0.5–1.2 cm. long, glabrous. *Calyx-tube* 4 mm. long, campanulate, glabrous; teeth about 1 mm. long, ovate, acute, minutely ciliate. *Vexillum* mottled, 1–1.3 cm. long, 7–8 mm. broad, obovate, with a linear claw

* *Sesbania Rogersii*, *Phillips et Hutchinson*, sp. nov.; affinia *S. hamatae*, *Phillips et Hutchinson*, sed foliis, paucijugis inflorescentiis 1–3-floris, tubo staminorum filamentorum partibus liberis longiore differt.

Plantae simplices vel ramosae usque ad 30–70 cm. altae; caulis costatus, aculeis ornatus, ceterum glaber. *Folia* 1.5–6 cm. longa; rachis 3–4 cm. longus, subteres; foliola 5–8-juga, subsessilia, 0.5–1.3 cm. longae, 2–4 mm. lata, oblonga, obtusa, breviter et obtuse mucronata, supra minute nigro-lepidotis; stipulae setaeae, 4.5 cm. longae. *Inflorescentia* axillaris, racemosa, 2–6 cm. longa, 1–4-flora, folio subtendente longior vel brevior; pedunculi basin versus aculeis brevibus instructi; bractae 5 mm. longae, lanceolatae, acuminatae, deciduae; bracteolis similibus mox deciduis; pedicelli 0.5–1.2 cm. longi, glabri. *Calycis tubus* 4 mm. longus, campanulatus, glaber, dentibus circiter 1 mm. longis ovatis acutis minute ciliolatis. *Vexillum* irregulariter maculatum, 1–1.3 cm. longum, 7–8 mm. latum obovatum, ungue lineari 2–4 mm. longo apice bifidenticulato. *Alae* 1.3–1.4 cm. longae, 3 mm. latae, oblongae, obtusae, ungue lineari 3 mm. longo dente reflexo; carina 1.3–1.5 cm. longa, obtusa, concava, ungue 5–8 mm. longo lineari. *Tubus staminis* 1–1.3 cm. longus basi 1.5–2 mm. latus, antheris 0.5 mm. longis, oblongis. *Ovarium* breviter stipitatum, 1–1.2 cm. longum, 4-alatum; stylus 3–3.5 mm. longus, arcuatus, apicem versus pubescens, stigmate parvo. *Fructus* 9–15 cm. longi, 1–1.2 cm. lati, lineares, acuminati, late 4-alati, medio pallidiores. *Semina* atrorubrobrunnea, 5 mm. longa, 2.5 mm. lata oblonga, utrinque fere truncata, glabra.

2-4 mm. long and two raised ridges above the claw. *Alae* 1.3-1.4 cm. long, 3 mm. broad, oblong, obtuse, with a linear claw 3 mm. long and a short downward projecting tooth. *Carina* 1.3-1.5 cm. long, obtuse, concave, with a linear claw 5-8 mm. long, and a projecting tooth almost at right angles to the limb. *Staminal sheath* 1-1.3 cm. long, 1.5-2 mm. broad at the base; free portion of the filaments shorter than the tube, arcuate; anthers 0.5 mm. long, oblong; free stamen bent near the base, but not swollen. *Ovary* shortly stipitate, 1.1-1.2 cm. long, four-winged; style 3-3.5 mm. long, arcuate, pubescent near the apex; stigma small. *Fruit* 9-15 cm. long, 1.1-1.2 cm. broad, linear, acuminate, broadly four-winged, with a lighter coloured band in the middle of the valves. *Seeds* dark reddish-brown, 5 mm. long, 2.5 mm. broad, oblong, almost truncate at both ends, glabrous.

TROPICAL AFRICA: Rhodesia: Victoria Falls, April, *Flanagan* 3109; North-West Rhodesia, without locality, *Rogers* 8747.

This is a very peculiar species with exactly the appearance of *S. aculeata* in regard to its vegetative and floral characters, but with fruits broadly four-winged as in *S. tetraptera*. It apparently provides a link between the two sections of the genus.



THE NATAL SPECIES OF THE SAPINDACEAE.

By E. P. PHILLIPS, M.A., D.Sc., F.L.S., Botanist in Charge of the
National Herbarium, Pretoria.'

DURING a short stay in Durban in January, 1919, I saw for the first time, in their native state, species of *Sapindaceae* growing in the Stellabush. This led me to make an examination of the material in the Natal Herbarium, and at the same time I took the opportunity of describing the species. To make the records more complete than it was possible to do from the material in the Natal Herbarium alone, all the Natal specimens in the Bolus Herbarium and Cape Government Herbarium at Capetown and the National Herbarium, Pretoria, were examined. This has added considerably to the Natal localities in which the species occur.

Twelve genera of the order *Sapindaceae* have been recorded from South Africa, and of these nine occur in Natal. Wood, in his "Handbook to the Natal Flora" (1907), cites sixteen Natal species, but he eventually dropped *Schmidelia natalensis* in his "Revised List of the Natal Flora." Of the fifteen species mentioned by Wood, only ten are represented in the Natal Herbarium, and of those unrepresented I have not seen specimens from Natal in any other herbarium.

The examination of the material has brought to light an undescribed *Bersama* which occurs in Natal, and I am of opinion that *Bersama tysoniana* also occurs there, though I have seen no Natal specimen.

KEY TO THE GENERA.

- Stamens eccentric. Fruit bladder. A twiner..... *Cardiospermum.*
- Stamens not eccentric. Fruit membranous, fleshy, coriaceous, or winged.
 - Trees or shrubs.
 - Whole plant densely villous with stellate hairs; leaflets deeply incised..... *Melianthus.*
 - Plants most glabrous; leaves or leaflets never deeply incised.
 - Leaves broadly ovate, palmately lobed; flowers scarlet..... *Greyia.*
 - Leaves or leaflets lanceolate or elliptic; flowers greenish or whitish.
 - Leaves simple.
 - Fruit almost globose, coriaceous..... *Allophylus.*
 - Fruit flattened with membranous wings..... *Dodonaea.*
 - Leaves compound.
 - Leaflets unequal-sided; rachis with broad or narrow wings.
 - Young branches, leaf rachis, and inflorescence densely tomentose..... *Hippobromus.*
 - Plant glabrous or almost so..... *Pteroxylon.*
 - Leaflets not unequal-sided; rachis not winged, or only winged in the uppermost segment.
 - Leaves trifoliate; sepals glabrous, pedicels 1 mm. long..... *Allophylus.*
 - Leaves pinnate, if trifoliate then pedicels 1 cm. long; sepals hairy.
 - Inflorescence a panicle up to 43 cm. long.... *Sapindus.*
 - Inflorescence a raceme up to 17 cm. long.... *Bersama.*

CARDIOSPERMUM LINN.

C. halicacabum Linn.

A herbaceous climber. *Stems* deeply five-furrowed with prominent ridges, scantily pubescent. *Leaves* 3-6 cm. long, trifoliate, each leaflet of the first order digitately divided into three leaflets of the second order; petiole 1.5-1.8 cm. long, furrowed, pilose; petiole of leaflets 8-11 cm. long, similar to the petiole of the leaf; ultimate leaf-segments 1.5-2.5 cm. long, 0.5-1.3 cm. broad, ovate or ovate-lanceolate, acute, hirsute above, glabrous beneath except on the veins, with the margins deeply cut into 2-3 lobes. *Inflorescence* a compound umbel with three principal peduncles, axillary; primary peduncle 3-7.2 cm. long, four-angled, pilose, and bearing at the apex two spirally-coiled tendrils; secondary peduncles 8-1.7 cm. long, scantily pubescent. *Sepals* unequal; the smaller 2 mm. long, 2 mm. broad, ovate, rounded above, glabrous; the larger 5 mm. long, 2-5 mm. broad, obovate, obtuse. *Petals* similar to the larger sepals. *Stamens* eccentric; staminal tube 1-5 mm. long; free portion of filaments 2.5-3 mm. long, linear, glabrous, sometimes ciliated; anthers 0.75 mm. long, oblong. *Ovary* 3 mm. long, eccentric, consisting of three carpels with a broad dorsal wing and a narrow ventral wing; style none; stigmas three, ovate, concave. *Torus* between the stamens and ovary produced into two blunt lobes 5 mm. long. *Fruit* 2-3-celled bladdery capsule with a single seed in each cell; the valves not veined and pubescent with bulbous base hairs. *Seeds* black, 4 mm. long, 3.5 mm. broad, somewhat globose, glabrous. *Sonder in Harv. and Sond., Fl. Cap., 1, 237, Bot. Mag., t. 1049.*

Natal: Verulam, March, *Wood* 483, and in *Colonial Herb.* 6795, without locality, *Sanderson, Gueinzuis.*

DISTRIBUTION: Rhodesia, Pondoland, Transvaal, Bechuanaland Protectorate.

MELIANTHUS LINN.

M. villosus Bolus.

A herbaceous shrub. All parts densely covered with stellate hairs. *Branches* tomentose. *Leaves* petioled, compound, paripinnate, 5-7-jugate, 8-19 cm. long; petiole 3.2-5.5 cm. long, densely villous; leaflets 2.5-7.5 cm. long, 6-3 cm. broad, lanceolate, subacute, slightly narrowed at the base, densely villous, with the margins deeply and acutely serrate; stipules 2.2 cm. long, 4 mm. broad, ovate-lanceolate, long acuminate, acute, densely villous. *Inflorescence* a terminal raceme 28 cm. long. *Peduncle* 12 cm. long, densely villous. *Bracts* 2.3 cm. long, 1.2 cm. broad, ovate, long acuminate, pubescent. *Pedicels* 2 cm. long, terete, villous. *Sepals* unequal; lateral sepals 2.6 cm. long, 1.3 cm. broad, elliptic, obtuse, tomentose within and without; anterior sepal 1.6 cm. long, 1 cm. broad, boat-shaped, ovate in outline, long acuminate, densely tomentose. *Petals* 1.9 cm. long, 2-3 mm. broad, linear, three-lobed above, densely pilose on the upper half, with the middle lobe tongue-shaped; the lateral lobes smaller, sometimes rudimentary. *Disc* in the form of flat fleshy glands 4-5 mm. long, 2 mm. broad, truncate at the apex. *Filaments* 6-9 mm. long, subterete, pilose; anthers 4.5 mm. long, 2 mm. broad, oblong. *Ovary* 4 mm. long, pyramidal in outline, four-angled, glabrous, four-celled, each cell containing many ovules; style 5 mm. long, subterete, somewhat falcate, narrowing to a blunt point, pubescent; stigma simple.

Natal: Rocky Hill, South Downs, 4000-5000 ft., December, *Wood* 1008, 4376, and in *Natal Govt. Herb.* 5133.

DISTRIBUTION: Elands River Valley, near Mont-aux-Sources.

M. insignis, O. Kuntze. I have not seen specimens of this species, but from the short description given by Kuntze (*Rev. Gen.* III, 43) it may possibly be the same as *M. villosus* Bolus.

GREYIA HOOK. AND HARV.

G. Sutherlandii Hook. and Harv.

A moderately sized tree (*Wood*). *Branches* glabrous. *Leaves* simple, petioled, 4–10 cm. long; petiole 1–4 cm. long, somewhat compressed, glabrous, dilated and amplexicaul at the base; lamina 3–7 cm. long, 2–8 cm. broad, ovate, obtuse, somewhat cordate at the base, glabrous, 8–9-lobed with the lobes coarsely toothed, palmatinerved with distinct veins. *Inflorescence* a dense raceme, 7–11 cm. long, 3·5–5 cm. broad. *Bracts* 1 cm. long, 5 cm. broad, lanceolate, obtuse. *Pedicels* 1·5 cm. long, terete, glabrous. *Sepals* 5 mm. long, 3 mm. broad, ovate, obtuse, glabrous, connate at the base. *Petals* red, 1·15 cm. long, 5·5 mm. broad, oblong, concave, rounded at the apex, glabrous, shortly ciliated. *Disc* basin-shaped, with a rim 2 mm. deep and produced into ten processes 2 mm. long, each bearing a flattened anther-like structure at the apex. *Filaments* reddish, 9·2 cm. long, terete, glabrous; anthers 3 mm. long, oblong. *Ovary* 7 mm. long, 3·5 mm. broad, ovoid, subapocarpus, five-celled, each cell containing numerous ovules; style 5 mm. long, gradually narrowed above, minutely five-toothed at the apex, glabrous. *Harv. Thes. Cap. t. 1, Harv. in Harv. and Sond. Fl. Cap. II, 309; Wood, Natal Plants t. 373.*

Natal: Polela, June, *Fernando*, 83; and in *Natal Govt. Herb.* 10470; Ixopo, September, *Fannin in Natal Herb.* 16241; Inanda, 2000 ft., *Wood in Natal Govt. Herb.* 95; Van Reenens Pass, 5800 ft., November, *Wood* 4691; without precise locality, *Sutherland*.

DISTRIBUTION: Orange Free State, Tembuland, Stutterheim, Transvaal.

ALLOPHYLUS LINN.

Leaves simple..... *monophylla*.

Leaves trifoliate.

Leaflets lanceolate; petiole glabrous; stigmas linear..... *erosa*.

Leaflets mostly elliptic; petioles pubescent; stigmas ovate..... *africana*.

Leaflets obovate or oblanceolate; petioles pubescent; stigmas linear... *decipiens*.

A. monophyllus Radkl.

A large spreading shrub or small tree, 10–30 ft. high and up to 12 in. stem diameter (ex *Sim*). *Branches* with minute mealy pubescence and greyish bark. *Leaves* simple, petioled, 2·5–2·3 cm. long, 2·5–8 cm. broad, elliptic, lanceolate, or ovate, acuminate, subobtuse, slightly narrowed or more rarely subrotund at the base, glabrous above and beneath, sometimes with tufts of hairs in the angles of the lateral veins beneath, darker above, with coarsely serrated margins; petiole 1·3–5 cm. long, terete, minutely pubescent or almost glabrous. *Inflorescence* a raceme, 4–17 cm. long, sometimes the flowers in groups of two on short secondary peduncles. *Peduncles* 1·5–5 cm. long, terete, minutely pubescent or glabrous. *Pedicels* about 1·5 cm. long. *Sepals* unequal, the smaller 1·5 mm. long, 1 mm. broad, elliptic, rounded above, deeply concave, glabrous; the larger 2 mm. long, 1·75 mm. broad, subrotund, concave, glabrous. *Petals* 2 mm. long, spatulate, densely bearded within. *Filaments* 2·5 mm. long, linear, pilose; anthers 4 mm. long, oblong. *Ovary* 1 mm. long, 2 mm. broad, didymous, pubescent; style 0·75 mm. long, terete, glabrous; stigmas 0·75 mm. long, linear, divergent. *Fruit* 9 mm. long, 7 mm. in the diameter, obovate in outline, slightly narrowed at the base, glabrous. *Schmidelia monophylla*, *Presl. Fl. Cap. I, 239. Sim, Forests and Forest Floras, 170, Pl. XXXII, Fig. 3, S. dregeana, Sond. in Harv. and Sond. Fl. Cap. I, 239.*

Without precise locality, Gerrard and McKen. 525, and in *Natal Govt. Herb.* 726.

Natal: Inanda, April, *Wood*, 481, and in *Colonial Herb.*, 5678, Ifafa, August (in fruit), *Lansdell in Natal Herb.* 16126; Imont, *Wood*, 2468; edge of bush at Spring Grange, c., 800 ft., April, *Wood, in Natal Govt. Herb.*, 11248; without locality, *Pappe*.

Zululand: Quden Forest, 6000 ft., February, *Davis* 118, and in *Natal Govt. Herb.*, 8700.

DISTRIBUTION: Komgha, Kentani, East Pondoland.

A. erosus Radkl.

A shrub 4–12 ft. high (ex *Sim*). *Branches* glabrous with wrinkled greyish bark. *Leaves* petioled, trifoliate, 6–12 cm. long, petiole 2–3 cm. long, channelled above, glabrous; leaflets sessile, 3–8.5 cm. long, 9–2.6 cm. broad, lanceolate, obtuse, narrowed at the base, glabrous, minutely punctate beneath, with the margins coarsely and bluntly serrate. *Inflorescence* an axillary panicle, 4–7 cm. long, the flowers ultimately cymose in groups of 2–4; peduncle grooved, minutely pubescent or almost glabrous. *Pedicels* 1 mm. long, glabrous. *Sepals* unequal, 1 mm. long, 0.75 mm. broad, obovate, rounded above, concave, glabrous. *Petals* white, 1 mm. long, 0.75 mm. broad, obovate, subrenate and almost truncate at the apex, densely bearded within. *Filaments* (in young flowers) 0.75 mm. long, linear, pilose; anthers 5 mm. long, oblong in outline. *Ovary* 1 mm. long, 1.5 mm. broad, obovate, in outline, pubescent; style 1 mm. long, terete, glabrous; stigmas 1 mm. long, linear, obtuse, divergent. *Fruit* 5 mm. long, 5 mm. in diameter, globose, narrowed at the base, finely and scantily pubescent, at length glabrous. *Schmidelia erosa* Arn. *Sond. and Harv. Fl. Cap. I*, 239. *Sim, Forests and Forest Flora*, 169, *Pl. XXXII*, Fig. 1. *S. natalensis*, *Sonder in Harv. and Sond. Fl. Cap. I*, 239.

Natal: Back Beach Bush, near Durban, 20 ft., April, *Wood, in Natal Govt. Herb.*, 11249. Durban, April, *Wood* 898, 7841, 10964, and in *Colonial Herb.*, 5693. Catos Creek, May (in fruit), *Wood in Natal Govt. Herb.*, 2469. Umgeni, August (in fruit), *Native Collector in Natal Herb.*, 16218. Port Shepstone, April, *Brown* 422; without locality, *Saunders*; Berea, *Wood*.

Sim states: "Abundant along the coast, and especially on the coast dunes from the Fish River to Natal; not found inland. This species is a shrub 4–12 ft. high and often forms a large proportion of the sea scrub. It stands sea winds where most other shrubs fail, close to the sea. Its timber is not used and is seldom heavy enough for economic purposes."

DISTRIBUTION: East London.

A. melanocarpus Radkl.

A shrub or small tree reaching 20 ft. or more in height (ex *Wood*). *Branches* minutely pubescent, at length becoming glabrous, with greyish bark. *Leaves* petioled, trifoliate (4.5), 22 cm. long; petiole 2.2–8.5 cm. long, channelled above, minutely and densely pubescent; leaflets darker above, paler beneath, shortly petioled, 2.5–12.5 cm. long, 1.2–4.5 cm. broad, elliptic, elliptic-lanceolate, ovate or ovate-lanceolate, acuminate, obtuse, rounded or more usually narrowed at the base, pubescent above and beneath, especially on the veins, sometimes almost glabrous, with a prominent mid-rib beneath and 7–11 lateral veins forming an acute angle with the mid-rib and distinct above, sometimes with distinct tufts of hairs in the angles between the mid-rib and the lateral veins on the under surface. *Inflorescence* an axillary panicle, 3.5–12 cm. long, with the flowers ultimately in cymose groups of 3–5 on short peduncles. *Peduncle* 2–4 cm. long, channelled, densely pubescent, branches of inflorescence similar to the peduncle. *Sepals* unequal, the smaller 1 mm. long, 0.75 mm. broad, more or less rotund, deeply concave, glabrous; the larger 1 mm. long, 1.5 mm. broad, ovate, rounded above, deeply concave, glabrous. *Petals* 1.5 mm. long, spatulate, bearded. *Filaments* 5 mm. long, linear, densely ciliated; anthers 5 mm. long, somewhat obovate in outline. *Ovary* 7.5 mm. long, 1.5 mm. broad, obovate in outline, pubescent, two locular, with a single ovule in each loculus; style 1 mm. long, terete; stigmas, two, reflexed, 0.75 mm. long, ovate, acuminate, acute. In male flowers filaments 1–1.5 mm. long, linear, ciliated; anthers, 0.5 mm. long, subglobose. *S. africana* D.C. *Harv. and Sond. Fl. Cap. I*, 238; *Wood, Natal Plants*, *Pl.* 572; *Sim, Forests and Forest Flora*, 170, *Pl. XXXIII*, Fig. 4. *S. melanocarpa*, Arn. in *Hook. Journ. Bot.* III, 153; *Sonder in Harv. and Sond. Fl. Cap. I*, 238. *S. leucocarpa*, Arn. in *Hook Journ. Bot.* III, 153; *Sonder in Harv. and Sond. Fl. Cap. I*, 238.

Natal: Near Phoenix Crossing, 400 ft., February, *Wood in Natal Govt. Herb.*, 1373. Berea, Durban, March, *Wood*, 11804, and in *Natal Govt. Herb.*, 13648. Woods near Durban, 150 ft., January, *Wood*, 22; Port Natal, *Drege*; *Gueinzius*, without precise locality, *Gerrard and McKen.*, 525, and in *Natal Govt. Herb.*, 94; in woods at Inanda, 1800 ft., January, *Wood*, 827, and in *Natal Govt. Herb.*, 5884. Ixopo, 4000 ft., February, *Schlechter*, 6648.

DISTRIBUTION: Rhodesia, Pondoland, Kentani, Swaziland.

A. *decipiens* Radkl.

Young branches pubescent, becoming glabrous with age. *Leaves* petioled, trifoliate 4-8.5 cm. long; petiole 1-3 cm. long, semiterete, pubescent; leaflets 1-6 cm. long, 0.4-2.1 cm. broad, obovate or oblanceolate, obtuse, sometimes rounded at the apex, cuneate at the base, entire or sometimes remotely crenate, glabrous above and beneath or pubescent on the mid-rib and primary lateral veins. *Inflorescence* in stalked axillary lax racemes, 4-7 cm. long, stalk 1-3 cm. long, pubescent; rachis pubescent. *Larger sepals* 1.25 mm. long, 1.75 mm. broad, more or less broadly oblong, concave; smaller sepals 1.5 mm. long, oblong, deeply concave. *Petals* 1.5 mm. long, spatulate, truncate or 2-3-lobed at the apex, with 1-2 processes on the inner face, ciliate. *Filaments* 0.5 mm. long, ciliate; anthers 0.5 mm. long, oblong in outline. *Ovary* 0.5 mm. long, didymous, pubescent; style divided to the middle; stigmas 0.75 mm. long, linear, slightly recurved. *Fruit* 6 mm. long, 6 mm. in diameter, globose, glabrous. *Schmidelia decipiens*, *Arn. in Harv. and Sond., Fl. Cap. I*, 239.

Not seen from Natal; stated by Wood to have been collected there by Dregé.

Schmidelia rehmanniana, Szyszy., collected by Rehmann (No. 9038) near Durban, I have not seen, but from the description given suspect it to be *A. melanocarpus* Radkl.

DISTRIBUTION: Graaff-Reinet, Knysna, Kingwilliamstown, Albany, Uitenhage, Stockenström, Somerset East, Swellendam.

DODONEA LINN. F.

D. *viscosa* Linn.

Branches glabrous, with reddish bark. *Leaves* sessile, 4-9.5 cm. long, 1-3 cm. broad, oblanceolate, rounded and obtuse or shortly acuminate and subobtuse at the apex, narrowed at the base, glabrous, gland-dotted above and beneath, with the mid-rib prominent beneath, entire. *Inflorescence* a terminal panicle, peduncle glabrous, glandular. *Pedicels* 5-9 mm. long, glandular. *Sepals* unequal, 2.5-3 mm. long, 0.75-1.5 mm. broad, lanceolate or elliptic, obtuse, glandular without, usually three-veined. *Petals* absent. *Filaments* 0.5 mm. long; anthers 1.5 mm. long, 0.75 mm. broad, oblong. *Ovary* 1.5 mm. long, 1.5 mm. in diameter, globose, densely glandular, two-locular with two ovules in each loculus; style 2 mm. long, thick, terete, glabrous, bifid at the apex. *Fruit* 1 cm. long, 1.5 cm. broad, transversely oblong, two-winged, two-celled with two seeds in each cell. *Seeds* black, 1.5 mm. long, 1.5 mm. broad, discoid, glabrous. *Sonder in Harv. and Sond. Fl. Cap. I*, 242.

Natal: Shores of Natal Bay, 50 ft., September, *Wood*, 7928, and in *Natal Govt. Herb.*, 2246; near Durban, September, *Wood*, 1928, 484; and in *Colonial Herb.*, 6794.

I find that this species differs from the generic description by having a two-locular ovary.—(*E. P. P.*)

HIPPOBROMUS E. & Z.

H. *alata* E. & Z.

A small tree, evergreen or nearly so, 10-30 ft. high (ex *Sim*). *Branches* minutely and densely pubescent on the young parts, becoming almost glabrous on the older parts. *Leaves* petioled, paripinnate, 3-6-jugate; petiole 0.7-2 cm. long, terete or somewhat flattened above, densely tomentose; rachis winged, tomentose; leaflets 1-3.5 cm. long, 0.7-2 cm. broad, obovate, obtuse, narrowed at the base, unequal sided, giving the leaflet a falcate appearance, darker above than beneath, glabrous, usually pubescent on the

mid-rib above and beneath, coarsely serrate usually on the convex side, sometimes entire, with the mid-rib prominent beneath. *Inflorescence* an axillary raceme shorter than the leaves, sometimes grouped into a dense terminal panicle. *Pedicels* 2 mm. long, terete, densely tomentose. *Sepals* unequal, 2.5–3 mm. long, 1.75–2.5 mm. broad, elliptic or subrotund, densely tomentose without, ciliated. *Petals* 3 mm. long, 2.5 mm. broad, obovate, glabrous. *Disc* annular. *Filaments* 2.5–5 mm. long, linear, glabrous, tapering gradually from the base upwards; anthers 1.5 mm. long, elliptic, in outline. *Ovary* rudimentary, tomentose. *Fruit* 0.7 mm. long, 1 cm. in diameter, three-celled with a single seed in each cell, pilose. *Seeds* 5 mm. long, 5 mm. in diameter, almost globose, somewhat flattened or channelled on the inner face, glabrous. *Sonder in Harv. and Sond. Fl. Cap. I, 241. Sim, Forest and Forest Flora, 172, Pl. XXXIV.*

Natal: Stellabush, Durban, September, *Van der Bijl in Natal Herb.*, 16243, 16244; without precise locality or collector in *Natal Govt. Herb.*, 93; Verulam, Wood, 606.

DISTRIBUTION: Port Elizabeth, Kentani, Somerset East, Uitenhage, Albany, Stocken-stroom.

PTAEROXYLON, E. & Z.

P. utile E. & Z.

Branches glabrous, youngest with greyish bark, turning dark brown in older branches. *Leaves* petioled, pinnately compound, 6–7-jugate, 3–12 cm. long; petiole 1–2.5 cm. long, minutely pubescent, furrowed above; leaflets 1–3 cm. long, 0.5–1.5 cm. broad, oblong, obtuse or retuse at the apex, sometimes shortly mucronate, unequal at the base, entire, with the mid-rib prominent above and beneath and the lateral veins distinct, glabrous. *Inflorescence* racemose, massed at the ends of the branches, about 3 cm. long. *Peduncle* pubescent. *Flowers* often in three-flowered cymes on the raceme. *Pedicels* 4 mm. long, pubescent, articulated at the base. *Bracts* 2 mm. long, lanceolate-linear. *Calyx* 1.5 mm. long, ovate, subobtuse, pubescent. *Petals* 5 mm. long, 2 mm. broad, oblong, obtuse, glabrous. *Filaments* 3 mm. long, linear, gradually narrowing from the base upwards; anthers 1.5 mm. long, elliptic in outline, flattened, cordate at the base. In female flowers: *Ovary* 1.5 mm. long, 1.5 mm. broad, almost circular in outline, somewhat flattened, pubescent. *Style* 1 mm. long, terete, pubescent; stigma bilobed, discoid. *Fruit* 1.3 cm. long, oblong in outline, somewhat compressed, dehiscing into two valves; valves deeply keeled, glabrous.

No specimen from Natal seen.

DISTRIBUTION: Uitenhage, Somerset East, Komgha.

SAPINDUS, LINN.

S. oblongifolius Sond.

Shrub or small tree 6–10 ft. high (ex Wood). *Branches* minutely pubescent. *Leaves* petioled, paripinnate, 4–11-jugate, 18–26 cm. long; petiole 5–11 cm. long, terete, glabrous or sparsely pilose; leaflets subsessile, 3.5–12.5 cm. long, 1.5–4 cm. broad, lanceolate, rarely elliptic, obtuse, glabrous, with the mid-rib prominent beneath, entire. *Inflorescence* a panicle up to 43 cm. long. *Peduncle* pubescent, the main axis of the panicle and branches densely tomentose. *Pedicels* 3 mm. long, terete, densely tomentose. *Calyx* 6 mm. long, 4 mm. broad, elliptic in outline, deeply concave, densely tomentose without, long-ciliated. *Petals* 6 mm. long, 3–5 mm. broad, spathulate, densely ciliated, with a flat claw appendage 1 mm. long and 2.25 mm. broad and densely ciliate arising from the inner face. *Filaments* 2.5 mm. long, linear, long-ciliated; anthers 1.5 mm. long, oblong. *Disc* deeply saucer-shaped with a rim 1.5 mm. high, thin, more or less triangular in outline with rounded angles. *Ovary* 3 mm. long, 4 mm. in diameter, sub-apocarpus, three-locular with a single ovule in each loculus, densely pilose. In male flowers the filaments are slightly longer and the ovary rudimentary, otherwise similar to the perfect flowers. Wood, *Natal Plants Pl. 89. Sim, Forests and Forest Flora, 173, Pl. XXXV. Sond. in Harv. and Sond. Fl. Cap. I, 240.*

Natal: Near Durban, 100 ft., *Wood*, 1917, and in *Natal Govt. Herb.*, 2213; Berea, Durban, 100-200 ft., May, *Wood*, 11869, and in *Natal Govt. Herb.*, 13053; Port Natal, *Saunderson* (?).

Wood states: "In the 'Flora Capensis,' Vol. I, 240, this plant is described as dioecious. We find, however, that it is certainly polygamous, and plants which in one season bear a larger number of perfect flowers, in another season bear male ones only, or with but very few perfect ones." In the Stellabush at Durban I saw trees well over 20 ft. high.—(*E. P. P.*)

DISTRIBUTION: Komgha.

BERSAMA, FRESEN.

Mid-rib on lower surface of leaf covered with long straight hairs..... *Stayneri*.

Mid-rib quite glabrous.

Leaves usually 2-3-jugate; leaflets obovate, usually rounded at the apex, obtuse..... *lucens*.

Leaves usually 4-jugate; leaflets oblong-lanceolate, acuminate, acute.. *abyssinica*.

B. *Stayneri* Phillips.

Bark thick and rough. *Branches* glabrous, rough with longitudinal furrows. *Leaves* pinnate, petioled, 7-16 cm. long, 4-5-jugate; petiole 1-2 cm. long, very densely pilose; rachis densely pilose; leaflets 1.7-5.2 cm. long, 0.8-1.5 cm. broad, oblong-lanceolate or elliptic, acute and mucronate at the apex, rarely rounded, slightly cuneate at the base, the mid-rib deeply sunk on the under surface, which is frequently somewhat rugose, prominent beneath and with the lateral veins distinct beneath, glabrous above pilose or pubescent beneath, especially on the mid-rib. *Inflorescence* a shortly peduncled many-flowered raceme, 3.5-6.5 cm. long; peduncle 1-1.5 cm. long, very densely pilose. *Bracts* 3 mm. long, linear, tomentose. *Pedicels* 5 mm. long, terete, tomentose. *Calyx* 6 mm. long, densely tomentose, divided almost to the base. *Petals* 1.3 cm. long, 3 mm. broad, spathulate-linear, tomentose, reflexed in open flowers. *Filaments* 5 mm. long, semiterete, monadelphous and villous at the base. *Ovary* densely villous; style 3 mm. long, terete; stigma subglobose. *Fruit* 2.7-3 cm. long, dehiscing by four valves; valves woody, covered with woody protuberances. *Seeds* reddish in colour, 1.1 cm. long, 6 mm. in diameter, ellipsoid with a waxy yellow arillus at the base.

Natal: Without locality, *Stayner in Herb. Bolus*; Stinkwood Forest, Ingeli, Natal, May, *Chilvers in Herb. Forest Dept.*, 1518; Mkanzeni, Riversides, Natal, *Henkel in Herb. Forest Dept.*, 2421.

B. *lucens* Szysz.

A shrub 8-10 ft. high (ex *Wood*). *Branches* glabrous, with wrinkled greyish bark. *Leaves* petioled, compound, imparipinnate, 2-4-jugate, 10-20 cm. long; petiole 1.5-5.5 cm. long, glabrous, rarely pubescent; leaflets 1.8-9 cm. long, 1.3-4.5 cm. broad, obovate or obovate-elliptic, rarely elliptic, very rarely subacute, slightly narrowed at the base, glabrous, with the mid-rib distinct above, prominent beneath, and with thickened wavy margins. *Inflorescence* a lax axillary or terminal raceme, 6-14.5 cm. long, many-flowered; peduncle pubescent. *Pedicels* 0.4-1 cm. long, terete, densely tomentose with fine adpressed hairs. *Bracts* 0.5 mm. long, ovate, pubescent. *Calyx* gamosepalous; lobes 3-4 mm. long, 2 mm. broad, ovate or ovate-elliptic, obtuse, finely but densely pubescent without and with fine adpressed hairs within, ciliated; the two posterior lobes connate and bifid at the apex. *Petals* dull yellow, 8.5 mm. long, 2.5 mm. broad, above, oblong, obtuse, narrowed into an evident claw, pubescent. *Disc* unilateral. *Filaments* all connate at the base, 1 cm. long, terete, glabrous except at the; base the anterior filaments ciliated at the base and forming a tomentose shield 3 mm. long and 2.5 mm. broad; the posterior filaments ciliated and pubescent at the base; anthers 2.5 mm. long, 1.5 mm. broad, oblong. *Ovary* 1 mm. long, 1.5 mm. broad, subglobose, densely villous, four-locular with a single ovule in each loculus; style 7 mm. long, cylindric, pubescent on the lower half;

